SOUTH PACIFIC COMMISSION NOUMEA,
NEW CALEDONIA.

CHEMICAL COMPOSITION OF SOUTH
PACIFIC FOODS AN
ANNOTATED BIBLIOGRAPHY.

By Peters (F.E.)

Technical Paper No. 100

CHEMICAL COMPOSITION OF SOUTH PACIFIC FOODS

An Annotated Bibliography

F. E. PETERS

Noumea, New Caledonia
PRICE 6/- STERLING

THE SOUTH PACIFIC COMMISSION

The South Pacific Commission is an advisory and consultative body set up by the six Governments responsible for the administration of Island Territories in the South Pacific region. Its purpose is to recommend to the member Governments means for promoting the well-being of the people of these territories. It is concerned with social, economic and health matters. Its headquarters are at Noumea, New Caledonia.

The Commission was established by an Agreement between the Governments of Australia, France, the Netherlands, New Zealand, the United Kingdom and the United States of America, signed at Canberra on the 6th February, 1947, and finally ratified on the 29th July, 1948. Until the 7th November, 1951, the area of the Commission's activities comprised territories lying generally south of the equator from and including Netherlands New Guinea in the west to the French Establishments in Oceania and Pitcairn in the east. On 7th November, 1951, an additional Agreement was signed at Commission headquarters in Nouméa on behalf of the six participating Governments, extending the scope of the Commission to include Guam and the Trust Territory of the Pacific Islands under United States administration.

The Commission consists of twelve Commissioners, two from each Government, and from 1948 until 1953 met twice a year. It now normally holds one Session each year. There are two auxiliary bodies, the Research Council and the South Pacific Conference.

The Research Council, which assembles once a year, held its first meeting in May, 1949. Members are appointed by the Commission, and are selected for their special knowledge of the questions with which the Commission is concerned, and the problems of the territories in these fields. The chief function of the Research Council is to advise the Commission what investigations are necessary. Arrangements to carry out those that are approved are the responsibility of the Secretary-General and other principal officers.

The South Pacific Conference, which meets at intervals not exceeding three years, consists of delegates from the local inhabitants of the territories, who may be accompanied by advisers. The first Conference was held in Suva in April, 1950, and was attended by delegates from fifteen territories and from the Kingdom of Tonga. The second Conference was held at Commission headquarters in April, 1953, and the third Conference at Suva in April, 1956.

The Commission's staff includes six principal officers, as follows: Secretary-General, Dr. Ralph C. Bedell; Deputy Secretary-General, Mr. John Ryan; Executive Officer for Health, Dr. E. Massal; Executive Officer for Economic Development, Dr. A. H. J. Kroon; Executive Officer for Social Development, Dr. R. Seddon. The powers and functions of the Deputy Chairman, Research Council, are at present being exercised by the Secretary-General.

Further particulars of the Commission's activities may be obtained from the Secretary-General, Nouméa, New Caledonia.

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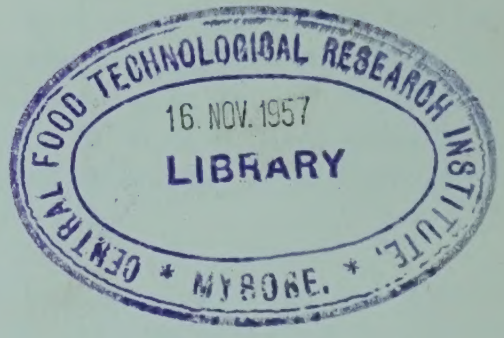

South Pacific Commission
Nouméa, New Caledonia
January, 1957

This paper is issued by the South Pacific Commission for general information. The Commission does not accept responsibility for the statements contained therein.

PREFACE

The South Pacific Commission in the course of its studies of nutritional problems in the South Pacific undertook the investigation of the chemical composition of foodstuffs commonly used in the area.

As a supplement and guide to the actual analytical work carried out by him, Mr. F.E. Peters, Biochemist to the Commission, found it necessary to assemble and collate a large amount of literature recording previous work carried out in this and related fields. This documentation has now taken shape as the annotated bibliography which follows.

Mr. Peters had already compiled a "Bibliography of Nutritional Aspects of the Coconut", Technical Paper no. 58, 1954. The large demand for this document made it necessary to prepare a revised edition, Technical Paper no. 95, 1956.

In undertaking the present publication the South Pacific Commission was aware of the three bibliographies published by the University of Hawaii Press as a result of a recommendation made by the Pacific Science Association in 1949. These are:

A Pacific Islands Nutrition Bibliography,
by Robert J. Fanning, 1951.

Nutrition Bibliography of Malaya,
by P.C. Leong, 1952.

Nutrition Bibliography of Indonesia,
by S. Postmus and al., 1955.

Mr. Peters' publication is a contribution to this common effort.

Anyone who has had to undertake a similar task will appreciate the very large amount of work involved in the reading and abstracting of the articles to which reference is made, and will also understand that a large amount of detailed and exacting work is involved in the final preparation of such a bibliography for presentation, and we are grateful to Mr. Peters and to those who have assisted him in the work.

The summaries given cover a wide range of technical papers, and present in convenient form references, which we are confident will be of value to all who are concerned with the problems of food and feeding in the South Pacific, especially in relation to the subsistence of the indigenous peoples of the area.

Dr. E. Massal
Executive Officer for Health

C O N T E N T S

ANNOTATED BIBLIOGRAPHY OF THE CHEMICAL COMPOSITION OF FOODS USED IN THE SOUTH PACIFIC

1. ADOLPH, W.H. & LIU, HSI-CHEN

"The value of sweet potato in human nutrition".

Chinese Med. J., (1939) 55, 337-342.

Three adults were fed on sweet potato only for periods of 5 to 8 weeks. Nitrogen balance was maintained with a daily intake of 2 kg. of sweet potato per day.

(Chem. Abstr., (1940) 34, 1053^5).

2. ADRIAENS, L.

"La banane. La composition chimique envisagée du point de vue alimentaire. (The banana. The chemical composition considered from the nutritional point of view)".

Bull. Agr. Congo Belge, (1953) 44, 232-233.

Analyses of bananas from Ruanda-Urundi gave the following values: 72.5-79.5% water, 0.94-1.09% ash, 0.51-1.28% nitrogenous matter, 0.05-0.12% fat, 0.20-0.42% fibre and 18.83-25.27% carbohydrate.

3. ADRIAENS, L.

"Toxicité du manioc au Congo belge. (Toxicity of manioc from the Belgian Congo)".

Inst. roy. colonial belge. Sect. Sci. nat. et med. Mim. 1945) 13, No. 4, 140 pp.

Information is given on the liberation of hydrocyanic acid from cassava roots. An extensive literature review and bibliography is appended.

4. ADRIANO, F.T.

"Possibilities of developing the cassava industry in the Philippines".

Philippine J. Agr., (1933) 4, 271-285.

The small scale manufacture of cassava flour is discussed. An analysis of fresh cassava is given as 81.4% edible portion, 63.8% moisture, 1.44% ash, 0.96% protein 0.26% fat, 0.02% HCN, 0.85% crude fibre, 27.65% starch, and 5.04% soluble sugars. The calorific value is given as 1403 cal./kg.

5. ADRIANO, F.T., RAMOS, H.T. & YNALVEZ, L.A.

"The proximate chemical analysis of Philippine foods and feeding stuffs. III".

Philipp. Agric., (1932) 20, 530-534.

Results obtained for some of the foods are listed below (one variety unless otherwise stated):

	Water %	Ash %	Ether extract %	N x 6.25 %	Fibre %	Starch %
Colocasia sp. (4 varieties)	70.6-81.5	1.2-1.5	0.2-0.6	1.2-2.2	0.5-0.8	9.8-18.4
Colocasia esculentum (4 varieties)	58.1-74.0	1.1-1.7	0.2-0.8	0.9-1.5	0.6-1.2	17.6-29.6
Cyrtosperma merkusii	69.3	1.4	0.4	0.7	1.4	19.1
Xanthosoma sagittifolium (3 species)	54.3-68.4	1.9-2.7	0.3-0.4	1.5-2.0	0.6-0.9	22.7-37.2
Dioscorea pentaphylla	80.0	1.1	0.2	2.3	0.4	14.4
Dioscorea luzonesis	65.0	0.9	0.9	3.2	0.9	25.0
Dioscorea esculenta (6 varieties)	69.6-77.2	0.7-1.3	0.1-0.6	1.2-3.0	0.5-1.2	10.5-21.6
Dioscorea alata (6 varieties)	70.6-74.8	1.1-1.4	0.1-0.5	1.7-2.3	0.7-1.6	17.1-20.3
Ipomea batatas (7 varieties)	61.2-73.8	1.3-2.1	0.1-0.6	0.9-1.5	0.9-1.0	19.2-29.1
Ipomea batatas leaves	84.3	1.7	0.5	2.9	1.5	0.9
Ipomea reptans leaves	91.3	1.6	0.3	4.4	1.0	0.5
Artocarpus communis	87.7	1.2	0.7	3.1	2.6	2.3
Momordica charantia fruit	93.6	1.0	0.6	0.6	1.7	0.3
Momordica charantia leaves	84.7	2.8	0.1	0.5	1.7	1.1

5. (Cont'd)

	Water %	Ash %	Ether extract %	N x 6.25 %	Fibre %	Starch %
Moringa olifera leaves	76.4	2.5	2.9	5.0	1.5	0.5
Portulaca oleracea leaves	92.3	2.5	0.3	2.3	0.9	0.8
Amaranthus viridis leaves	87.3	4.1	0.6	4.5	1.3	0.4

6. AIRAN, J.W. & BARNABAS, J

"Amino-acids in Bengal almond".

J. Indian Chem. Soc., Ind. News Ed., (1953) 16, 127-128.

Amino-acids in the bud, flower, leaf and fruit of Terminalia catappa were examined.

(Chem. Abstr., (1954) 48, 6515a).

7. AIRAN, J.W. & GHATGE, N.D.

"Mineral content of Carilla plant".

J. Univ. Bombay, (1950) 18, Pt. 5, Sect. A, Sci. No. 27, 19-21.

The dried root of Momordica charantia contains 12.8% ash. The dried fruit contains 11.7% ash, 0.35% Fe, 1.66% P.

(Chem. Abstr., (1951) 45, 1303i).

8. AIRAN, J.W. & SHAH, S.V.

"Fatty oils from the seeds of Momordica charantia and Momordica dioica".

J. Univ. Bombay, (1942) 11, 105-108.

The oil from Momordica charantia had the following characteristics: d_{25} 0.9962, n_{25} 1.4985, acid no. 4.75, saponification No. 181.3, I no. 73.33, Reichert-Meissel no. 2.52, polenske no. 0.62; unsaponifiable matter 0.6%. The glycerides contain 15.31% stearic acid and 78.59% oleic acid.

(Chem. Abstr., (1943) 37, 2202[1]).

9. ALARCO, A.C.

"Chromatographic and photocolourimetric determinations of carotene in certain food plants".

Rev. facultad farm. y bioquim., Univ. nacl. mayor San Marcos (Lima, Peru), (1946) 7, No. 29-30, 53-66.

Amongst other foods, the carotene content of fresh sweet potato is given as 13.65 γ/gm.

(Chem. Abstr., (1947) 41, 2177a).

10. ALLEN, O.B. & ALLEN, E.J.

"Manufacture of poi from taro in Hawaii, with special emphasis upon its fermentation".

Hawaii. Agric. Exp. Sta. Bull., (1933) 70, 1-32.

Figures given are quoted from Chatfield, C. & Adams, G. (5

11. de ALMEIDA, J.R. & VALSECCHI, O.

"Fermentation of the Java plum (Eugenia jambolana)".

Brasil azucar., (1950) 36, 103-105.

The fruit contains 1.0% protein, 0.38% fat, 10.71% reducing sugars, 0.12% sucrose, 2.27% cellulose, 0.51% ash. The fermented juice yields an agreeable colourless beverage.

(Chem. Abstr., (1951) 45, 1295d).

12. de ALMEIDA, J.R. & VALSECCHI, O.

"Fermentation of Uvalha".

Brasil açucareiro, (1952) 39, No. 3, 83-85.

The fruits of Eugenia uvalha contain 90.22% water, 1.87% protein, 0.44% fat, 2.92% total sugars, 2.28% reducing sugars, 1.21% cellulose, 0.44% ash; pH of the juice is 4.25.

(Chem. Abstr., (1952) 46, 11490d).

13. ALPERT, E.

"Nutrition and dietary patterns in Micronesia".

U.S. Commercial Co. Econ. Survey of Micronesia, (1946) 18, 23 pp. (typed).

Consists of three parts: 1) appraisal of nutritional status of native population groups; 2) estimation of nutritive value of native dietary; 3) recommendations for improving nutritional status of natives. Physical examinations were limited to observations of some manifestations of nutritional deficiency diseases. Individual weights were not obtained. Attempts to obtain dietary histories proved impossible, principally because of language difficulties. Only dietary patterns were considered to determine foods available, foods eaten, and foods required. No laboratory procedures were carried out because of lack of space for suitable equipment.

(Fleming, R.J.: Pacific Islands Nutrition Bibliography (1951). p. 1, Univ. Hawaii Press).

14. ANONYMOUS "The composition of some Chinese foods".

Univ. Hawaii Occas. papers, (1925) 3.

A table of percentage composition of some 31 Chinese foods; a compilation of all available analyses that could be secured at that time, with weights of 100 calorie portions and approximate measures. Vitamin content of four foods is given.

(Fanning, R.J.: Pacific Islands Nutrition Bibliography, (1951) p. 2, Univ. Hawaii Press).

15. ANONYMOUS "Composition of nipa palm seeds".

Bull. Imp. Inst., (1933) 31, 3-5.

A sample of mature and immature kernels had the % composition: 10.2, 8.2 water, 3.6, 4.4 crude protein, 0.4, 1.1 fat, nil, nil starch, 4.5, 6.6 crude fibre, 1.6, 4.0 ash respectively.

16. ANONYMOUS "Pawpaw leaves rich in protein".

Rhod. Agric. J., (1935) 32, 769.

It is reported that air-dried leaves without stalks contained 9.7% water, 11.1% ash, 22.5% N x 6.25, 3.9% fat, 9.7% fibre and 43.1% carbohydrate (by difference).

17. ANONYMOUS "Taro processing".

Hawaii. Agric. Exp. Sta., Ann. Rept., (1937) 49-54.

A sample of taro flour prepared from wet land taro gave on analysis: 7.75% water, 1.55% ash, 2.00% protein, 0.56% ether extract, 1.42% crude fibre, 77.91% starch, 0.52% reducing sugars, 0.11% sucrose, 2.58% pentosans, 0.52% dextrin, 89 mg.% calcium, 69.3 mg.% chlorine, 0.3 mg.% copper, 4.3 mg.% iron, 82 mg.% magnesium, 1.0 mg.% manganese, 149 mg.% phosphorus, 408 mg.% potassium, 14.7 mg.% sulphur and 0.1 mg.% zinc.

18. ANONYMOUS "Granadilla (passion fruit) seed from Kenya".

Bull. Imp. Inst., (1937) 35, 22-23.

The seed contained 8.5% moisture and yielded on extraction with petroleum ether 22.4% (24.5% on dry basis) of oil having the following characteristics: d15/15 : 5/5 0.9261, n20 1.4761, acid value 0.3, saponification value 190.9 I value (Wijs, 1 hr.) 141.2%, unsaponifiable matter 0.8%. The residual meal had the following composition: water 11.0%, crude proteins 12.1%, oil 0.1%,

18. (Cont'd)

nitrogen free extract 19.2%, crude fibre 56.0%, ash 1.6%, alkaloids and cyanogenetic glucosides none. The oil is semi-drying, could be employed for soap-making, and probably also for edible purposes after refining. The residual meal would be unsuitable for feeding purposes on account of the high fibre content. (Chem. Abstr., (1937) 31, 4519^2).

19. ANONYMOUS

"La papaya "Colombiana. (The papaya "Colombiana)".

Rev. Agr. Puerto Rico, (1939) 31, 82-85.

The green fruit of the "Colombiana" papaya were shown to contain: 92.3% water, 0.67% protein, 0.26% fat, 1.0% fibre, 6.28% carbohydrate, 0.48% ash, 25.7 mg.% calcium, 21.4 mg.% phosphorus and 2.77 mg.% iron.

20. ANONYMOUS

"Tablas del valor intaminico de productors vegetales comestibles. (Tables of the vitamin values of edible vegetable products)".

Pubs. Inst. nacl. nutricion Buenos Aires, Pubs. cient. C.N.P., (1945) 29, 9-55.

	Carotene mg%	Ascorbic acid mg%	Thiamine mg%	Riboflavin mg%	Niacin mg%
Ipomoea batatas	0.350	7.25	0.037-0.169	0.050-0.230	1.0-1.2
Portulaca oleracea	2.386	19.8	0.025	0.154	1.6
Musa sapientum	0.061	1.9	0.066	0.081	1.2

21. ARROYAVE, G., PIZZATI, S., BRENSANI, R. & VALDEZ, F.

"Contenido de diversos nutrientes en alimentos procedentes de Centro-America. 1. Verduras subterraneas, verduras herbaceas, frutos-verduras y frutas. (Content of various nutrients in Central American foods. 1. Roots, green vegetables, green and coloured fruits)".

Arch. venezol. Nutricion, (1954) 5, 61-70.

Results obtained include the following:

21. (Cont'd)

	Water %
Ipomoea batatas	63.0-71.5
Dioscorea alata	72.8
Xanthosoma violaceum	78.3
Amaranthus hybridus	87.4
Musa paradisiaca (green)	58.0-64.5
Musa paradisiaca (ripe)	75.2
Mangifera indica	83-90
Carica papaya	88.5

22. ASENJO, C.F. & GOYCO, J.A.

"Puerto Rican fatty oils. 5. The characteristics and composition of expressed papaya. (Carica papaya L.) seed oil".

Oil & Soap, (1943) 20, 217-218.

Expressed papaya seed oil showed: specific gravity $\frac{25}{25}$ 0.9113, refractory index 20^{o} 1.4671, iodine number (Hanus) 65.3, saponification number 199.0, acid value 2.69, acetyl value 10.93, Reichart-Meissel number 1.38, Polenske number 0.93, unsaponified matter 1.17%.
Glycerides of oleic 80.0%, Myristic 4.57, Palmitic 12.79%, Stearic 1.78%.

23. ASENJO, C.F., GOYCO, J.A. & FERNANDEZ, M. del C.

"Calcium oxalate in maya fruit".

J. Am. Pharm. Assoc., (1944) 33, 344-345.

Calcium oxalate dihydrate crystals were detected in maya fruit, pineapple and Puerto Rican taro. Total (free and combined) oxalic acid, as calcium oxalate dihydrate, was found to be: 0.0838% in fresh whole maya fruit, 0.008% in fresh whole pineapple, and 0.126% in the fresh edible portion of wild Puerto Rican taro.

(Chem. Abstr., (1945) 39, 564^{5}).

24. ASENJO, C.F., MUNIZ, A.L. & QUINTANA, ..L.

"Growth response of folic acid depleted in rats to supplementation with tropical foods".

Food Res., (1950) 15, 326-330.

Breadfruit seeds, fresh mango fruit and fresh custard apple were among the foods examined. It was estimated that boiled, dried breadruit seeds (Artocarpus integrifolia L.) contained 190 µg % folic acid, fresh mango (Mangifera indica L.) contained less than 20 µg % folic acid and fresh custard apple (Anona reticulata L.) contained less than 20 µg % folic acid.

25. ASENJO, C.F., TORRES, R.M., FERNANDEZ, D. & de URRUTIA, G.V.

"Ascorbic acid and dehydro ascorbic in some raw and cooked Puerto Rican starchy foods".

Food Res., (1952) 17, 132-135.

Various taros and breadfruit were shown to contain the following amounts of ascorbic acid plus dehydro ascorbic acid when raw and after cooking:

25. (Cont'd)

		Raw	Cooked	
Caladium colocasia (L.)	(4)	5.2	2.0	mg/100 g
Xanthosoma sagittifolium (L.)	(4)	9.8	3.1	"
Xanthosoma atrovirens C.	(4)	17.5	5.6	"
Artocarpus communis Forst	(2)	23.2	11.9	"

(Figures in brackets refer to number of samples tested).

26. ASIKAGA, M.

"Ascorbic acid in sugar cane".

J. Soc. Trop. Agr., Taihoki Imp. Univ., (1938) 10, 412-419.

The distribution of ascorbic acid in the matured stem was uniform. The content of ascorbic acid was higher in non-matured plants.

(Chem. Abstr., (1939) 33, 9365^{2}).

27. ASTURIAS, R.

"The bread tree and its significance for the manufacture of bread".

Bol. agr. caminos Guatamala, (1930) 9, 105-107.

Chem. Zentr., (1930) II, 3473.

Flour prepared from the fruit of Artocarpus communis L. contains 7.2% fat, 17.5% protein, 68.0% carbohydrate and 3.2% fibre.

(Chem Abstr., (1932) 26, 3306^{8}).

28. AXTMEYER, J.H.

"A study of the vitamin B complex of yellow yautia (Xanthosoma sagittae-folium) and of plantain (Musa paradisica, L.)"

Puerto Rico J. Publ. Hlth. Trop. Med., (1930) 6, 229-252.

Using rat growth studies, thiamine was found to be the first limiting factor in the Xanthosoma.

29. AXTMEYER, J.H. & COOK, D.H.

"Nutrition studies of foodstuffs used in the Puerto Rican dietary. V. Vitamin A contents of arracacha, egg plant, squash, chayote, pigeon pea, chickpea, string beans, mamey, red pepper, broiled green plantain, okra and cassava."

Puerto Rico J. Pub. Hlth. Trop. Med., (1933) 8, 407-412.

The vitamin A content of broiled green plantain and of cassava is given as 20.0 and 0.5 units/g respectively.

30. AXTMEYER, J.H. & SILVA, S.

"Nutrition studies of foodstuffs used in the Puerto Rican dietary. III. The vitamin G (B_2) content of the ripe plantain (Musa paradisiaca, L.) and the pigeon pea (Gandul), (Cajan cajan, L.)."

Puerto Rico J. Pub. Hlth. Trop. Med., (1932) 8, 1-4.

Ripe plantain contains 0.5 units/g of vitamin B_2.

31. BACHSTEZ, M. & CAVALLINI, G.

"Chemical composition of canavalia obtusifolia".

Chimica e industria (Italy), (1935) 17, 652.

The nuts do not contain any HCN or alkaloids, but contain a very active urease. The chemical composition of the fruit is as follows: 10.42% water, 2.5% ash, 0.65% fat, 4.25% N, 53.77% starch.

(Chem. Abstr., (1936) 30, 3585^3).

32. BAILLON, A.F., HOLMES, E. & LEWIS, A.H.

"The composition of, and the nutrient uptake by, the banana plant, with special reference to the Canaries".

Trop. Agr., (Trinidad), (1933) 10, 139-144.

An analysis of the fruit of the Cavendish banana is given as 83.1% water, 1.02% N, 0.27% P_2O_5, 3.57% K_2O, 0.15% CaO, 0.26% MgO and Nil Fe_2O_3.

33. BANERJEE, H.N. & PAIN, A.K.

"Vitamin C in chewing betel leaf (Piper betel)".

Science & Culture, (1937) 2, 523.

Five varieties of betel leaves were examined. The leaves were found to contain 0.043-0.225 mg./g. ascorbic acid, whilst stems contained 0.022-0.100 mg./g. ascorbic acid.

34. BAPTIST, N.G.

"Determination of essential amino acis in some Ceylon vegetables".

Brit. J. Nutr., (1954) 8, 205-217.

The seeds of the jack-fruit (Artocarpus integrifloria), and the leaves of Sesbania grandiflora and of Ipomoea aquatica were found to contain:

gn/100g.	Artocarpus integrifloria	Sesbania grandiflora	Ipomoea aquatica
Dry weight	1.75	5.71	4.70
Arginine*	3.9	11.7	9.7
Histidine*	1.7	3.3	2.7
Lysine*	5.8	4.8	4.6
Isoleucine	4.8	4.1	3.8

34. (Cont'd)

gN/100g	Artocarpus integrifloria	Sesbania grandiflora	Ipomoea aquatica
Tryptophan*	1.1	1.4	1.3
Cystine*	1.0	1.1	1.5
Methionine*	0.8	0.6	1.0
Threonine*	4.3	3.5	3.6
Phenylalanine*	4.1	3.2	3.1
Leucine*	5.3	5.9	5.3
Valine*	6.6	5.1	4.7

* Amino-acid nitrogen as a percentage of the total nitrogen.

35. BAR, J.A. "Evaluation of vitamin C in some of our (Peruvian) mountain fruits".

Rev. cienc., (Peru). (1939) 41, 503-509.

Mountain fruits are richer in vitamin C than those of coastal regions as determined by titration with 2,6-dichlorophenol-indophenol. The richest are the mountain papaya, 17.27 international units; mountain pineapple, 12.4; and mountain oranges (Huanuco) 11.76; limes have more than lemons.

(Chem. Abstr., (1940) 34, 4477[5]).

36. BARNETT, W.L. "Analyses".

J. Jamaica Agr. Soc., (1941) 45, 264.

Ripe and green bananas, and breadfruit were shown to have the following composition:

	Water	Protein	Carbohydrate	Fibre	Ash	Ether extract
	%	%	%	%	%	%
Bananas ripe	73.9	1.7	22.8	0.2	0.8	0.6
green	75.1	1.4	21.4	0.7	0.9	0.2
Breadfruit	46.2	2.3	45.1	4.2	1.8	0.4

37. BASU, K.P., BASAK, M.N. & DE, H.N. "Human nutrition. IV. Availability of calcium ingested in the process of chewing betel nut leaves with lime".

Indian J. Med. Research, (1942) 30, 309-313.

Calcium ingested in the process of chewing betel nut leaves is well absorbed and utilized.

38. BASU, K.P. & GHOSH, D. "Availability of calcium in lady's-finger (Hibiscus esculentus), cabbage (Brassica oleracea capitata), drumstick (Moringa oleifera), and amaranth tender (Amaranthus gangeticus).

38. (Cont'd)

I. Experiments on growing rats;
II. Availability of calcium in vegetables determined by metabolism experiments on a human adult".

Indian J. Med. Research, (1943) 31, 29-35, 37-39.

The calcium of amaranth was 43% utilized in spite of the high oxalate content.

39. BASU, K.P. & NATH, H.P.

"Biological value of the proteins of papaya (Carica papaya) and lady's finger (Hibisucs esculentus)".

Ann. Biochem. Exp., Med., (1942) 2, 71-72.

The nutritive values of the proteins of Carica papaya and Hibiscus esculentus were determined by the nitrogen-balance method with adult rats. Carica papaya and ockra contained 92 and 90% moisture, respectively and 1 and 2.2% protein, respectively. The mean biological values (4 experiments) of papaya (9% protein level) and ockra (10% protein level) were 46 and 42, respectively and the digestibility in the same experiments varied between 85.5 and 88.9 for papaya and between 83.0 and 85.3 for ockra. The quality of the proteins of papaya and ockra was even inferior to that of most of the pulse proteins studied by Basu and co-workers. Neither papaya nor ockra is important as a source of protein.

(Chem. Abstr., (1943) 37, 4104[4]).

40. BAUER, A., DENNING, H. & MILLER, C.D.

"Thiamine, riboflavin and niacin contents of foods commonly used in Hawaii".

Hawaii. Agric. Exp. Sta., Report, (1948-50) 101-106.

The values obtained for 100 g edible portion of some of the foods examined were:

	Moisture	Thiamine	Riboflavin		Niacin
			Chemical	Microbiological	
	%	µg	µg	µg	mg
Taro leaves					
Hawaiian					
raw	82.5	230	410	464	1.60
cooked	83.6	173	438	450	1.56
Chinese					
raw	80.5	168	281	440	1.34
cooked	81.4	131	280	415	1.24

40. (Cont'd)

	Moisture	Thiamine	Riboflavin		Niacin
			Chemical	Microbiological	
Taro corms	%	g	µg	µg	mg
Hawaiian					
Variety 1					
raw	62.6	21[illegible]	39	30	0.6[illegible]
cooked	74.3	111	45	30	0.47
Variety 2					
cooked	74.1	[illegible]0	40	29	0.42
Chinese					
raw	55.4	17[illegible]	20	26	0.60
cooked	59.6	10[illegible]	21	25	0.5[illegible]
Japanese					
raw	74.4	[illegible]4	17	16	0.64
cooked	74.9	73	16	15	0.60
Poi (30% solids)					
Sample 1					
Corm					
raw	61.5	23[illegible]	20	43	0.75
cooked	63.8	80	14	28	0.57
fresh	69.8	[illegible]0	34	25	0.45
4 days old	-	60	15	27	0.45
Sample 2					
Corm					
raw	57.9	172	40	35	0.70
cooked	63.3	[illegible]6	22	29	0.64
fresh	70.0	78	23	23	0.49
Sample 3					
Corm					
raw	57.0	274	45	43	0.91
cooked	59.8	103	14	27	0.58
fresh	64.0	93	37	38	0.64
4 days old	-	82	26	49	0.67
Breadfruit					
raw	67.3	1[illegible]0	54	71	0.9[illegible]
	-	137	-	83	0.9[illegible]
cooked	65.2	1[illegible]9	54	67	1.0[illegible]
	-	124	-	90	1.[illegible]6
Papaya					
large	87.6	3[illegible]	32	30	0.[illegible]7
Solo					
Pistillate	85.9	21	41	36	0.40
Hermaphrodite	87.4	20	46	29	0.2[illegible]
Mango					
Bishop	85.9	49	44	41	0.52
common					
ripe	81.0	57	59	62	0.[illegible]2
green	[illegible].0	35	49	44	0.[illegible]3
Naden					
Sample 1	89.5	27	32	35	0.[illegible]
Sample 2	85.1	54	65	42	0.33
Pirie	86.9	53	39	42	0.3[illegible]

40. (Cont'd)

	Water	Thiamine	Riboflavin		Niacin
			Chemical	Microbiological	
	µg	µg	µg	µg	mg
Bananas, baking					
raw	64.5-68.6	43-48	50-59	43-56	0.74-0.79
cooked	66.6-70.2	33-41	51-63	46-59	0.65-0.69
eating	74.7-79.2	26	41	39	0.60-0.62
Pineapple	88.7	133	28	19	0.19
Amaranth					
raw	92.4	6	143	156	0.75
cooked	92.3	5	146	155	0.84
Sweet potatoes					
tops					
raw	89.0	132-184	297-440	352-422	1.05-1.37
cooked	86.6-88.5	114-150	283-336	342-395	1.06-1.62
roots					
raw	68.8	127	23		0.63
cooked	67.3	117	29		0.57

41. BHATIA, B.S.
SIDDAPA, G.S. &
GIRDHARI, L.

"Composition and nutritive value of Jack fruit (Artocarpus integrifolia).

Indian J. Agr. Sci., (1955) 25, 303-306.

The ripe fruit consists of 29% flesh, 12% seed, and 59% rind. The flesh contains 73% water and, on a dry weight basis, 3.6% ash, 1.6% protein, 1.2% acid (as citric), 3.2% fibre, 18.3% reducing sugars, 57% sucrose, 121 mg% CaO, 69 mg% P_2O_5 and 5 mg% iron. There is some carotene and ascorbic acid. The seeds contain 12% protein.

Chem. Abstr., (1956)50, 10302b).

42. BISWAS, H.G.

"Vitamin B_1 and B_2 content of Jack fruit seeds".

Sci. & Culture, (1937) 3, 56.

The seeds of the Jack fruit (Artocarpus integrifolia) when fed to vitamin deficient rats were shown to contain 9.5 units of vitamin B_1 and 19 units of vitamin B_2 per 100 g.

43. BOAN, R.F.

"The oil of the candle nut (Aleurites moluccana)".

J. Proc. Sydney Tech. Coll. Chem. Soc., (1938-40)8, 10-11.

Candle nut oil from New Guinea and Fiji had the following properties: spec. grav. 15°, 0.9280, 0.9285; acid value 0.63, 5.24; saponification value 188.2, 191.9; Wijs iodine value 162.2, 163.0, n^{25} 1.4765, 1.4768 respectively.

(Chem. Abstr., (1941) 35, 6822^8).

44. BODENSTEIN, J.C. "The composition of pineapples".

Sci. Bull., (1936) 153, 14 pp.

The fresh juice contained 16.24-18.93% total solids 10.80-12.9% sucrose, 1.55-1.82% glucose, 1.15-1.32% fructose, 1.01-1.05% acid (as citric) 0.038-0.046% N, 0.360-0.448% ash.

45. BOIS, E & SAVARY, J. "Saccharases and the sugars of Ipomea batatas and Solanum tuberosum".

Can. J. Research, (1942) 20 B, 195-201.

Both Ipomea batatas and Solanum tuberosum were found to contain an invertase, a "maltogenic" amylase and a "sucrogenic" amylase. Starch, sucrose and reducing sugars were also found, but not maltose.

(Chem. Abstr., (1943) 37, 2205[9]).

46 BONA, S.L. & CONCEPCION, I. "Vitamin C in Philippine camotes: comparison between the nutritive value of the camote and the potato".

Univ. Philippines nat. and applied Sci. Bull., (1940) 7, 415-422.

An average yellow camote (Ipomea batatas), 100-150 g. supplies 3,000 sherman units of vitamin A and 15 mg. vitamin C.

47. BORGAS, M.L. "Estudio de la vitamina B_1 en alganos alimentos cubanos. (Study of vitamin B_1 in some Cuban foods)".

Solubridad y asistencia social (Havana), (1943) 46, 140-183.

Thiamine was determined biologically by rat growth methods. Ripe bananas showed 0.105-0.122 mg.% whilst green bananas showed 0.165 mg.% thiamine, sweet potatoes contained 0.245 mg.% thiamine.

48. BOSWELL, V.R., DeORNIER, M.T., CAROLUS, R.L., EDMOND, J.B., GARRISON, O.B., COCHRAN, H.L. WOODARD, C., ANDERSON, W.S., MILLER, J.C. & WRIGHT, R.E. "Place and season effects on yields and starch content of thirty eight kinds of sweet potato".

U.S. Dept. Agr., Circ. No. 714, (1944) 15 pp.

This publication outlines a comparative study by the U.S. Department of Agriculture; the Ga., La., Miss., S.C. and Texas Agr. Expt. Stations; the Ga Coastal Plain Expt. Station; and the Va. Truck Expt. Station. Location and seasonal conditions at any one place have marked effects on the percentage of starch in sweet potatoes as well as upon the total yields and the commercial grades of the roots produced. Whenever drought is

48. (Cont'd)

potato roots per acre, the percentages of starch and of total dry matter in the roots are markedly reduced. There is a marked tendency for the starch content of the roots to vary inversely with the degrees of latitude of the location where they are grown. Several seedlings and introductions were significantly superior to the varieties commonly grown in the U.S. in starch superior to the varieties commonly grown in the U.S. in starch content, in yield of roots and in amounts of starch produced per acre. Tabulated data are given for the mean starch content and calcd. yields per acre of starch of 38 kinds of sweet potatoes grown at eight locations during the 3-year period, 1940-1942.

(Chem. Abstr., (1945) 39, 1235^{3}).

49. BOURDOUIL, C. "The change in composition of bananas during the process of ripening".

Bull. Soc. Chim. Biol., (1929), 11, 1130-1142.

Analyses were made at two daily intervals of bananas from the green stage to the soft pulpy stage (27 days). Total solids decreased from 30.31 to 23.27%. Reducing sugars increased from 0.06 to 8.64% whilst starch decreased from 22.94 to 0.83%.

50. BOURDOUIL, C. "The formation and transformation of the starch in bananas".

Rev. botan. appl. agr. trop., (1931) 11, 656-660.

The reducing sugars are transformed to starch during the growth of the fruit and when the fruit has attained its definite length, the starch is transformed to sugars in the course of ripening. Green bananas contain a large amount of starch along with an insignificant quantity of sucrose and invert sugars. For the first 6 days of ripening the starch content of the banana diminishes from 22.94% to 8.75% whilst the total sugars increase from 0.81 to 13.08%. In the six following days the total sugars increase to 19.17% at which time they reach a maximum. After this the total sugar content rapidly decreases. The water content of the pulp increases during ripening and this increase is even greater after the ripening period has passed.

(Chem. Abstr., (1932) 26, 753^{8}).

51. [illegible] & [illegible]: "Ipomoein, a globulin from sweet potatoes (Ipomoea batatas). Isolation of a secondary protein derived from ipomoein by enzymic action".

J. Biol. Chem., (1951) 93, 119-126.

The percentage composition of ipomoein and of the derived protein, on an ash free moisture free, basis was: 51.79%, 53.50% carbon, 7.19, 6.53% hydrogen, 16.16, 15.26% nitrogen, 2.25, 1.75% sulphur, 1.42, 1.62% cystine, 6.13, 4.79% arginine, 3.19, 2.50% histidine, 4.90, 4.98% lysine, 2.69, 4.7.% tryptophan and 7.03, 6.57% tyrosine respectively.

52. BRUNO, F. "Experiments on Aleurites".

Agr. Coloniale, (1940) 34, 479-480.

Seeds of Aleurites moluccana grown in Sicily were found to contain 4.7% water, 22.6% protein, 54.4% fat, 8.5% carbohydrates, and 3.8% ash.

53. CARAMA-BESA, S.F. & BATACLAN, M. "The sodium and potassium content of Philippine foods. 1. Foods of plant origin".

Acta Med. Philippina, (1952) 9, 1-30.

The sodium and potassium contents of 218 different food items were determined.

(Chem. Abstr., (1956) 50, 4415c).

54. de CARO, L. & LOCATELLI, A. "Vitamins A, B_1, B_2, C and D in bananas from Italian Somaliland".

Quaderni nutriz., (1937) 4, 32-42.

(Chem. Abstr., (1937) 31, 6294^6).

54a. de CARO, L. & LOCATELLI, A. "The vitamins A, B_1, B_2 and C content of raw and cooked sweet potatoes".

Quaderni. nutriz., (1938) 5, 11-20.

Chem. Zentr., (1938) II, 1985.

Raw and cooked sweet potato contains 75 I.U./% vitamin A, 50 I.U./% B_1, 250 I.U./% B_2, and 6-9 m.g./% ascorbic acid.

55. CARTENI, A., PARRELLI, S. & PIERGROSSI, A. "The chemical composition and energy value of products derived from bananas".

Quaderni nutriz., (1937) 4, 310-319.

Banana flour and dried banana values averaged 12.35% moisture, 0.40% N, 2.53% protein, 80.72% total sugars, 3.22% ash.

56. CHATFIELD, C. & ADAMS, G.

"Proximate composition of fresh vegetables".

U.S. Dept. Agric., Circular No. 146, (1931) 1-24.

Among the foods quoted are:

	Water %	N x 6.25 %	Fat %	Ash %	Fibre %
Amaranthus spp. leaves & stems	88.6	3.0	0.6	2.2	1.0
Colocasia esculenta tubers & corms	66.6	2.9	0.2	1.4	0.7
Colocasia spp. tubers & corms	75.1	2.0	0.2	1.2	0.8
Colocasia spp. leaves & stems	87.8	2.7	0.7	1.6	1.4
Tetragona expansa	91.4	2.2	0.2	2.1	0.8
Ipomea batatas tubers	68.5	1.8	0.7	1.1	1.0
Ipomea batatas tops	89.6	2.3	0.3	1.6	1.2
Dioscorea alata	72.6	2.1	0.2	1.0	0.8

57. CHEN, CHAO-YU & WONG, LAI-CHEN

"A comparison of the nutritional potency of boiled steamed and baked sweet potato".

Nutrition Bull. (Coll. Agr., Natl. Szechuan Univ., Szechuan, China), (1941) 1, 19-22.

Experiments in vitro with saliva and pepsin indicate that the starch and protein of baked sweet potato are more easily digested than those of boiled or steamed sweet potato.

(Chem. Abstr., (1942), 36, 2298[1]).

58. CHILD, R.

"Ceylon candlenut oil. Aleurites moluccana L. Willd".

Oil & Soap, (1941) 18, 224-226.

Ceylon candlenut oil contained 5.0% saturated acids 29.6% oleic acid, 42.6% linoleic acid, and 23.8% linolenic acid. Unlike the oil from other Aleurites nuts Aleurites moluccana contain no eleostearic acid (40 references).

(Chem. Abstr., (1942) 36, 287[7]).

59. CAIRI COA, [illegible]
WHITE, P.L.
[illegible]
VILLAS, F.E.,
ALVISTUR, J.E.,
URQUIETA, A.R.
ROCA, [illegible]
[illegible]

"The composition of Peruvian foodstuffs".

Anales fac. med., Univ. nacl. mayor San Marcos, Lima, (1952) 35, 358-382.

Data are given for the water, calorific value proteins fat, carbohydrates, fibre, ash, calcium, phosphorus, iron, carotene, thiamine, riboflavin, niacin, and ascorbic acid content of 321 Peruvian foodstuffs.

(Chem. Abstr., (1953) 47, 8273h).

60. CHUNG, H.L. &
RIPPERTON, J.C.

"Utilization and composition of Oriental vegetables in Hawaii".

Hawaii. Agr. Exp. Sta., Bull., (1929) 60, 64 pp.

Analyses are given for the following foods:

	Water %	N x 6.25 %	Ether extract %	Crude fibre %	Ash %	Calcium mg%	Phos-phorus mg%	Iron mg%
Amaranthus gangeticus leaves	92.3	1.68	0.12	0.99	1.69	102	35	6.6
Colocasia esculenta								
shoots	95.4	0.93	0.09	0.58	0.85	13	30	1.7
stalks	92.3	0.79	0.13	1.44	0.92	66	32	10.1
roots								
Chinese	72.4	1.48	0.11	0.61	1.20	23	69	1.7
Japanese	81.4	1.44	0.07	0.63	1.12	13	32	1.5
Momordica charantia	89.2	1.49	0.12	1.68	1.8	22	107	2.4
Ipomea reptans leaves	92.3	1.94	0.14	1.13	1.22	77	64	3.2
Pueraria thunbergiana	68.6	2.13	0.05	0.73	1.45	66	69	1.9
Dioscorea batatas	78.2	1.11	0.12	0.96	0.98	8	41	7.4

61. GILLIE, C. [illegible]
JOUBERT, F.J.

"Occurrence of an amylopectin in the fruit of the granadilla".

J. Sci. Food Agr., (1950) 1, 355-358.

The starch of Passiflora edulis, approximately 0.7% of the weight of the fruit, is almost pure amylopectin having side chains of average length of 17 glucose

62. CLARK, A. & WATERS, R.B.

"The presence of a sapotoxin in Xanthosoma atrovirens, a tropical food tuber".

Biochem. J., (1934) 28, 1131-1134.

A highly poisonous sapotoxin was isolated from Xanthosoma atrovirens tubers. Sublethal doses cause a glomerulo-tubular nephritis.

63. CLARK, H.E.

"Oxalates in pineapples".

Research, (1939) 4, 75-79.

The results of analyses are reported.

(Chem. Abstr., (1939) 33, 6465^{7}).

64. COCHRAN, H.L.

"Carotene content of sweet potatoes".

Proc. Ann. Soc. Hort. Sci., (1942) 41, 259-264.

A review with sixteen references.

(Chem. Abstr., (1943) 37, 6757^{4}).

65. COOK, D.H. & QUINN, E.J.

"The vitamin B content of white yautia, yellow yautia and plantain".

Amer. J. Trop. Med., (1928) 8, 73-77.

Plantain, yellow yautia (Xanthosoma sagittaefolium) and white yautia (Xanthosoma caracu) which had a proximate composition of 67.8, 68.5, 63.3% water, 1.4, 2.9, 4.7% N x 6.25, 0.5, 0.3, 0.4% ether extract, 0.3, 0.5, 0.8% fibre and 0.1, 1.4, 1.0% ash respectively, were stated to contain 1.0 and 0.6 units of vitamin B per gram respect. 0.3, 1.0, 0.6.

66. COOK, D.H. & RIVERA, T.

"Note on the effect of feeding raw and cooked tubers".

Puerto-Rico J. Pub. Hlth. Trop. Med., (1931) 6, 341-345.

It was found that Caladium colocasia, Xanthosoma caraca and Xanthosoma hastatum were toxic to white rats when fed raw, but were non-toxic after cooking.

67. COOLEY, J.S.

"Sweet potatoes - world production and food value".

A review.

(Chem. Abstr., (1948) 42, 4288g).

68. CRAVIOTO, B.R., LOCKHART, E.E., ANDERSON, R.K., MIRANDA, F. de P. & HARRIS, R.S.

"Composition of typical Mexican foods".

J. Nutr., (1945) 29, 317-329.

Foods examined included those listed on page 22.

69. CHERNICIJV, N.

"Chemical variations in vegetable products".

Arch. venezolanos nutric., (1951) 2, 139-144.

A discussion of the variations in starch and enzyme contents due to location in the potato and cassava and variations between individual roots and tubers of the same vegetable.

(Chem. Abstr., (1953) 47, 2692a).

70. DAMODARAN, M. & SRINIVASAN, M.

"Ascorbic acid content of some Indian plant materials".

Proc. Indian Acad. Sci., (1935) 2 B, 377-386.

The leaves of Sesbania grandiflora were found to contain approximately 200 mg% ascorbic acid.

71. DENNETT, J.H.

"Ash of nipah juice and some experiments on preservation using alcohol and heat as sterilizing agents and copper, sulphate and lime as preservatives".

Malayan Agr. J., (1929) 17, 437-448.

The composition of the juice of cultivated and wild palms was: (g./100 cc.) 0.630, 0.576 ash, 0.036, 0.047 nitrogen, 0.227, 0.183 K_2O, 0.025, 0.024, P_2O_5. 0.187, 0.185 Cl, 0.012, 0.020 SO_3, 0.003, 0.008 CaO, 0.005, 0.013 Mg O respectively.

72. DHINGRA, D.R., SETH, G.L. & SPEER, P.C.

"Indian seeds fats - Kowha (Barcia latifolia) and Tamal (Garcinia morella) fats".

J. Soc. Chem. Ind., (1933) 52, 116-118T.

The percentage of fatty acids of Garcinia morella seed fat (excluding non-fatty matter) was 0.3 C_{12}, 7.2 C_{14}, 42.5 C_{16}, 0.3 arachidic, 43.6 oleic, 6.1 linoleic.

(Chem. Abstr., (1933) 27, 3975).

73. DAPESHWARKAR, G.A. & NAGAR, A.G.

"Effect of blanching, processing and storage on the vitamin C content of some Indian fruits and vegetables".

J. Sci. Ind. Res., (India), (1952) 11 A, 264-265.

73. (Cont'd)

Hot water blanching of bananas at 85° for 5 minutes, chillies at 95° for 5 minutes and guavas at 95° for 7 minutes destroyed 93.3, 92.9 and 96% respectively of ascorbic acid oxidase. The loss of ascorbic acid under those conditions was 21, 29 and 32.3% respectively. Stem-blanched and peeled potatoes lost 51.2% ascorbic acid. Hot-water blanching and lye peeling of guavas caused 11 and 28% ascorbic acid loss respectively. Pineapples lost only a small amount of ascorbic acid during canning. Products stored at 30° showed ascorbic acid losses at 4 and 12 months respectively as follows: potatoes, 66.8, 75.6; guavas, 52.0, 66.8; pineapples, 82.9, 84.9; mangoes, 48.0, 59.5%. The pH of the sirup or brine in canned products was: guavas 3, potatoes 5, pineapples 2, and mangoes 4. Fresh ascorbic acid values, mg./100 g., were: bananas 13.9-19.9; chillies 59.7-124.7; guavas 121-186.9. Fresh canned ascorbic acid values were: potatoes 13.3, guavas 138, pineapples 15.9, and mangoes 26.4

(Chem. Abstr., (1953) 47, 7694g).

74. EDDY, W.H.

"The nutritive value of the banana".

New York Columbia University, (1932) 37 pp.

(Chem. Abstr., (1933) 27, 3995[4]).

75. ENGEL, C. & de VRIES, A.M.

"The tocopherol (vitamin E) contents of different foods from the Dutch East Indies". (In English).

Z. vitaminforsch, (1946) 18, 89-90.

The vitamin E content of the following foods was found to be:

	mg%
Ipomoea batatas leaves	8.1
Ipomoea reptans leaves	11.8
Moringa oleifera leaves	7.4
Amaranthus sp. leaves	2.6
Carica papaya leaves	36.0

76. ESCUDERO, A., HERRAIZ, M.L. de ALVAREZ HERRERO, M.G., LISARTE, M.A. & BENEDETTI, M.A.

"The content of carotene, thiamine, riboflavin, ascorbic acid and nicotinic acid of some samples of fruits of the 1943 harvest".

Rev. Asoc. argentina dietol., (1945) 3, No. 9, 67-72.

Tables give analyses of 37 lots of various varieties of pineapples, bananas, coconuts and other fruits.

(Chem. Abstr., (1945) 39, 4989[7]).

77. EZELL, B.D. & WILCOX, M.S.

"The ratio of carotene to caratenoid pigments in sweet potato varieties".

Science, (1946) 103, 193-194.

Appreciable amounts of yellow pigments other than carotene were found in sweet potatoes. Carotene/total pigment ratio increased with greater concentrations of total pigments.

(Chem. Abstr., (1946) 40; 2239^2).

78. FAN, W.H. & HOU, H.C.

"Carotene contents of certain Nanking vegetables and fruits".

Chinese Med. J., (1953) 71, 127-134.

The carotene content of 58 Chinese fruits and vegetables was determined.

(Chem. Abstr., (1953) 47, 11358e).

79. FANNING, R.J.

"Pacific Islands Nutrition Bibliography".

University of Hawaii Press, (1951) 1X + 70 pages.

A bibliography consisting of some 206 references, covering all aspects of nutrition in the Pacific with particular reference to Hawaii.

80. FANO, A. & ZANELLA, M.

"Vitamin C in bananas".

Biochem. terap. sper., (1937) 24, 399-405.

The content of ascorbic acid decreases progressively with maturation.

(Chem. Abstr., (1938) 32, 2980^3).

81. FEINGOLD, B.F.

"A vegetable milk substitute: taro".

J. Allergy, (1942) 13, 488-493.

Formulae are suggested for the use of taro flour as a milk substitute for infants. The taro flour considered had a composition of 7.75% water, 1.5% ash, 2.0% protein, 0.58% ether extract, 1.42% crude fibre, 77.91% starch, 0.52% reducing sugars, 0.11% sucrose, 2.50% pentosans, 0.52% dextrin, 69 mg.% calcium, 69.3% chloride, 3.3 mg.% copper, 4.3 mg.% iron, 82.0 mg.% magnesium, 1.0 mg.% manganese, 149 mg.% phosphorus, 408 mg.% potassium, nil sodium, 14.7 mg.% sulphur and 0.1 mg.% zinc.

82. FELLOWS, E.J. & SMITH, C.S.

"The chemistry of Passiflora incarnata".

J. Amer. Pharm. Ass., (1938) 27, 565-573.

A report on the pharmacological properties of Passiflora incarnata and a preliminary report on the extraction of the active depressor principle.

83. FERNANDEZ, C.

"Chemical study of various starches. I. Separation of amylose and amylopectin".

Ion, (1948) 8, 293-302.

Colocasia antiquorum was shown to contain 0.124% and 0.217% phosphorus for Spanish and foreign varieties respectively.
The starch was found to consist of 17.5% amylose, 79.4% amylopectin, 1.5% pentosans and little or no phosphatides.

(Chem. Abstr., (1948) 42, 9213g).

84. FINCKE, M.L. & SHERMAN, H.C.

"The availability of calcium from some typical foods".

J. Biol. Chem., (1935) 110, 421.

(Feingold, B.F.: J. Allergy, (1942) 13, 493.

85. FONSECA, C.

"Some data on the nutritive value of the banana".

Arquiv. Lig. Saŕde pública (Saô Paulo), (1939) 4, No. 6, 59-62.

New analyses of the macca and nanica varieties show 35.12, 30.67% dry substance, 1.05, 1.13% protein, 17.96, 16.53% glucose, 2.03, 2.41% sucrose, 0.78, 0.55% ash, small amounts of succinic, malic and tartaric acids, vitamins B and C are present.

(Chem. Abstr., (1940) 34, 1407[7]).

86. FONSECA, C.

"The food value of the banana".

Rev. alimentar (Rio de Janeiro), (1941) 5, No. 37, 29-30.

The composition of two varieties of banana and of banana flour are given.

(Chem. Abstr., (1945) 39, 2153[3]).

87. FRENCH, M.H.

"The feeding of poultry when normal foods are scarce".

E. African Agr. J. Kenya, Tanganyika, Uganda, Zanzibar, (1945) 10, 152-158.

87. (Cont'd)

Complete analyses are given of 2 types of seeds of Job's tears (Coix lachryma - Jobi).

(Chem. Abstr., (1946) 40, 1249[1]).

88. FRENCH, R.B. & ABBOTT, O.D.

"Levels of carotene and ascorbic acid in Florida grown foods".

Florida Agr. Exp. Sta. Bull., (1948) 444, 21 p.

The ascorbic acid and carotene values were found for the following foods:

	Carotene μg%	Ascorbic acid mg%
Banana	210	15
Bullocks heart (Anona sp.)	-	41
Guavas pink	3100	310
Guavas white	0	46
Mango	3100	30
Papaya	81	41
New Zealand spinach	4220	36

89. FRENCH, R.B., ABBOTT, O.D. & TOWNSEND, R.G.

"Levels of thiamine, riboflavin and niacin in Florida produced foods".

Florida Agr. Expt. Sta. Bull., (1951) 482, 5-19.

Included among the foods analysed were mango, papaya, passionfruit, banana and New Zealand spinach. These were shown to contain:

	Range of ten varieties of mango	Banana	Papaya	New Zealand spinach	Passionfruit
Dry matter %	6.6-16.3	27.3	12.3	8.0	27.6
Thiamine mg%	0.00-0.087	0.033	0.032	0.134	0
Riboflavin mg%	0.042-0.085	0.068	0.026	0.304	0.175
Niacin mg%	0.43-1.92	1.10	0.25	0.64	1.88

90. GALANG, F.G.

"Sweet potato experiments at the Lamao experimental station, Lamao, Bataan".

Philippine J. Agr., (1932) 3, 91-104.

Average results of the analyses of 14 varieties of sweet potatoes gave 62.8% moisture, 1.1% ash, 1.3% protein, 0.47% fat, 0.94% crude fibre and 33.4% carbohydrate.

(Chem. Abstr., (1933) 27, 5407).

91. GANE, R. "Acidity and sugar content of bananas during ripening .

Dept. Sci. Ind. Research, Rept. Food Investigation Board, (1935) 132-133.

The acidity of the pulp of bananas increases with ripening. It changes from about 5.4 in the green fruit to 4.34.

(Chem. Abstr., (1936) 30, 5084).

92. GARCIA, C.M. "A comparative study of nutrients of nuts of Pili (Canarium ovatum Engler)".

Philippine Agr., (1941) 30, 96-106.

Twenty eight samples of pili kernels were examined. The average composition of oven dried kernels was: 3.1% ash, 78.6% fat, 13.9% protein, 1.9% crude fibre, 2.6% N-free extract. They had a calorific content of 740-800 cal./100 g. The moisture content of the kernels was 23.7%.

(Chem. Abstr., (1941) 35, 72218).

93. de GARCIA PAULA, R.D. "Maniao. (Carica papaya L. caricaceas)".

Rev. Alimentar., (1938) 2, 251-252.

A survey of the dietary uses of papaya. Values found in Hawaii and the Philippines are quoted.

94. de GARCIA PAULA. R.D. & IACHAN, A. "Contribuicao ao estudo de vitaminas do complexo B (B_1, B_2 e niacina) em alimentos populares brasileiros. (Contribution to the study of the vitamin B complex (B_1, B_2 and niacin) in popular Brazilian foods".

Rev. Chim. ind., (1949) 18, 16-20.

The vitamin B complex was determined in some common Brazilian foods. The results for some of the foods are:

	Thiamine mg%	Riboflavin mg%	Niacin mg%
Dioscorea sp.	0.109	0.101	2.2
Colocasia sp.	0.100	0.083	1.1
Artocarpus incisa	0.120	0.050	-
Saccharum officialum	0.005	0.010	1.1
Amaranthus sp.	0.180	-	0.7

95. GESMUNDO, A.E. "The nutritive value of 'gallan, Cyrtosperma merkusii (Hassk) Schott".

Philipp. Agric., (1932) 21, 106-126.

A general survey on the use of Cyrtosperma in the Philippines. Feeding experiments with rats, chickens, rabbits and guinea pigs indicate that it is a good source of the water soluble vitamins. Analyses of various portions of the plant showed:

		Tuber	Young inflores-cence	Young leaves (without petioles or midribs)	Midribs & petioles
Water	%	59.82-69.32	89.36	86.32	91.86
Fat	%	0.32-0.42	0.65	0.65	0.32
Ash	%	1.22-1.60	1.57	2.02	1.29
Protein	%	0.72-1.38	2.38	5.04	2.15
Crude fibre	%	1.26-1.43	1.38	1.54	1.27
Nitrogen free extract	%	26.89-35.47	4.66	4.43	3.11

96. GOLDBURG, L. & THORP, J.M. "A survey of vitamins in African foodstuffs. III. The thiamine content of maize, kaffir and other cereals".

S. Africa J. med. sci., (1945) 10, 1-8.

Cassava is reported to contain 33γ% thiamine.

97. de GOLDFIEM, J.S. "Sugar content of African fruits".

Rev. Med. Trop., (1934) 26, 100-108.
Ber. Ges. Physiol. Exptl. Pharmakol., (1934) 82, 75.

Papaya is reported as containing 12.2% sugars.

(Chem. Abstr., (1937) 31, 2697^3).

98. GOMEZ. A.I., MATTILL, H.A. "Ascorbic acid and carotene content of plantain".

Food Research, (1949) 14, 177-181.

Plantain pulp contains 15-18 mg.% total ascorbic acid and 0.3 mg.% carotene.

(Chem. Abstr., (1950) 44, 10208a).

99. de GROOT, J.E., van HULSSEN, C.J. & HOOLMAAS, D.R. "'Iles' mannan meal".

Chem. Weekblad, (1939) 36, 69-73.

'Iles' meal is the unpurified ground dried bulbs of plants of the genus Amorphophallus which grow in East Indies. It contains 12.5% water and the dried meal contains ash 1.26%, reducing sugars 93.5%.

(Chem. Abstr., (1939) 33, 7924^6).

100. GOSSWEILER, J. "Plantas espontaneas e cultivadas pelos indigenas para efeitos da alimentacao. (Wild and cultivated plants used by the natives as food)".

An. Inst. Med. trop., Lisboa, (1953) 10, 1583-1603.

The botanical name and a brief description is given for 88 plants used as food by the natives of Angola.

101. GURNEY, E.H. "Composition of some fruit and fruit waste".

Qd. Agric. J., (1937) 47, 403-405.

Among the fruits examined were jackfruit, mango, paw-paw, passionfruit and 3 varieties of banana. The following results (See page 30), were obtained as a percentage of the edible portion.

102. GUTHRIE, J.D., HOFFPAUIR, C.L., STEINER, E.T. & STANSBURY, M.F. "Survey of the chemical compostion of cotton fibres, cottonseed, peanuts and sweet potatoes. A literature review".

U.S. Dept. Agr., Southern Regional Research Lab., (1944) AIC - 61, 86 pp.

(See following reference, no. 103).

103. GUTHRIE, J.D., HOFFPAUIR, C.L., STANSBURY, M.F. & REEVES, W.A. "Survey of the chemical composition of cotton fibres, cottonseed, peanuts and sweet potatoes. A literature review".

U.S. Dept. Agr., Southern Regional Research Lab., (1949), AIC-61, 116 pp.

A review of the data relating to the composition of sweet potatoes. 94 references are given.

104. HAAS, S.V. "Powdered ripe banana in infant feeding".

Arch. Pediatrics (1931) 48, 248-252.

Powedered ripe banana has the following percentage composition: 2.5% water, 3.18% ash, 1.5% fat, 4.86% protein, 3.25% fibre, 32.65% glucose, 33.18% sucrose, 9.6% dextrins, 7.8% starch. An ounce yields 116 cals.

(Chem. Abstr., (1931) 25, 4584[4]).

105. HALL, E.G. "The nutritive value of Australian tropical fruits".

Agric. Gaz. N.S.W., (1943) 54, 568-569.

Among the fruits examined were jackfruit, mango, paw-pawpaw and passionfruit. These fruits were found to contain the following nutrients:

101. (Cont'd)

| | Refr
tive
inde |
|---|---|
| Jackfruit | |
| fruit | |
| seeds | |
| Mango | |
| fruit | |
| juice | 1.3 |
| skins | - |
| Pawpaw | |
| fruit | - |
| juice | 1.3 |
| Passionfruit | |
| fruit | - |
| juice | 1.3 |
| seeds | - |
| Banana | - |

105. (Cont'd)

		Jackfruit	Mango	Pawpaw	Passionfruit
Water	%		81	87	81
Carbohydrates	%		16	10	17.5
Protein	%		0.7	0.6	1.2
Fat	%		0.2	0.1	nil
Ash	%		0.5	0.6	0.5
Calcium	mg%		5	20	
Phosphorus	mg%		16	13	
Iron	mg%		0.3	0.3	
Vitamin A	i.u	500	5,000	5,000	
Thiamine	mg%	0.06	0.06	0.02	
Riboflavin	mg%		0.05	0.04	
Ascorbic acid	mg%		50	70	25

106. HARRIS, R.S. & MUNSELL, H.E.

"Edible plants of Central America".

J. Home Econ., (1950) 42, 629-631.

A general article on the examination of Central America food plants. Included in the analyses quoted two Amaranthus species and the tips of sweet potato vines.

		Ipomoea batatas	Amaranthus hybridus	Amaranthus gangeticus
Calcium	mg%	111	288	578
Iron	mg%	2.9	30.2	3.6
Carotene	mg%	-	3.7	1.8
Riboflavin	mg%	0.26	0.30	0.27
Niacin	mg%	-	-	2.3
Ascorbic acid	mg%	56	64	86

107. HARRIS, P.L. & POLAND, G.L.

"Vitamin studies on bananas. I. The vitamin A, B_1 and C contents of ripe bananas".

Food Research, (1937) 2, 311-319.

Ripe bananas contain 71-95 I.U. per oz. vitamin A, 4-5 I.U. per oz. vit. B_1 and 57 I.U. per oz. vit. C.

(Chem. Abstr., (1938) 32, 1002^2).

108. HARRIS, P.L. & POLAND, G.L.

"Variations in ascorbic acid content of bananas".

Food Research, (1939) 4, 317-327.

The average ascorbic acid content of bananas regardless of their tropical source is relatively constant at 10-11 mg.%. Green bananas contained an average of 5.3 mg.%.

109. HARRIS, R.S., WANG, F.K., WU, Y.H., TSAO, C.S. & LOE, L.Y.S.

"The composition of Chinese foods".

J. Am. Diet. Assoc., (1949) 25, 28-38.

Fifty-six food samples from the Chinese mainland were analysed. Included in these foods were:

		Ipomoea reptans	Coix lacryma	Dioscorea batatas
Water	%	92.4	14.7	60.0
Ash	%	1.1	1.7	0.8
Nitrogen	%	0.3	2.1	0.2
Calcium	mg%	42	21	18
Phosphorus	mg%	35	52	21
Iron	mg%	3.0	0.4	1.2
Carotene	mg%	0.00	0.03	0.00
Thiamine	mg%	0.06	0.41	0.09
Riboflavin	mg%	0.12	0.10	0.07
Niacin	mg%	0.8	2.3	0.5

110. HARTZLER, E.R.

"The availability of ascorbic acid in papayas and guavas".

J. Nutr., (1945) 30, 355-365.

Availability of ascorbic acid of papayas and guava juice was determined by comparing urinary excretion of ascorbic acid by human subjects maintained on a diet low in ascorbic acid. No significant differences in availability of ascorbic acid of papayas or guava juice as compared with synthetic ascorbic acid, were found. All the ascorbic acid of papayas and guavas appears to be available.

111. HARTZLER, E.R.

"The carotenoid pigments of the papaya".

Hawaii Agric. Expt. Sta., Report, 1946-1948, 86-87.

The mean values for β-carotene, γ-carotene, cryptoxanthin and vitamin A (calculated) for two samplings of frozen papaya and one of fresh papaya were:

	β-carotene	γ-carotene	Cryptoxanthin	Vitamin A
	Micrograms per 100 grams			I.U. per 100 g
Frozen papaya (6 samples)	123	305	1230	1230
Frozen papaya (4 samples)	178	568	1448	1500
Fresh papaya (5 samples)	145	645	1398	1407

112. HARVEY, D. "The chemical composition of some Kenya foodstuffs".

Records of the Medical Research Laboratory, Kenya, (1951) No. 10, 12 pp.

Amongst the foods examined were Portulaca quadrifida and Amarantus blitum leaves. These were found to contain 85.82, 84.25% water; 1.65, 4.36% N x 6.25; 0.77, 0.36% fat; 1.94, 1.73% fibre; 5.76, 5.96% carbohydrate (difference); 4.06, 3.34% ash; 0.264, 0.697% nitrogen; 146, 358 mg.% calcium; 79, 83 mg.% sodium; 423, 670 mg.% potassium; 65, 112 mg.% phosphorus; 36, 90 mg.% chlorine, respectively. Six samples of sweet potato gave 68% water, 1.97% protein, 0.14% fat, 0.73% fibre, 1.01% ash, 0.316% nitrogen, 25 mg.% calcium, 28 mg.% phosphorus, 54 mg.% sodium, 508 mg.% potassium, and 36 mg.% chlorine.

113. HERNANDEZ, M.G. "Contenido de vitaminas en las frutas Cabanas. (The vitamin content of Cuban fruits".

Agronomia (Cuba), (1943) 3, 58-59.

The mean vitamin C content of two varieties of Carica papaya is given as 39.1 and 47 mg.%, of Anona muricata as 10.8 mg.% of Anona squamosa as 17.6 mg.%, and of two varieties of Musa paradisica as 0.9 and 0.3 mg.%.

114. L'HEUREUX, L. & BASTIN, R. "Two starches from the Belgian Congo. I. That from the tuber of Smilax Kraussiana Meisn. II. That of Colocasia antiquorum Schott".

IV. Congr. Int. Tech. Chem. Ind. Agric., Bruxelles, (1935) 2, 351-362.

Starch from Colocasia antiquorum was yellowish in colour, contained 14.46% moisture, 74.72% dry matter as starch and 4.86% dry matter as protein. An aqueous solution gave a slightly acid reaction. The starch consisted of two types of grains 1-1.5 μ and 3-4 μ in size. No oxidose was present.

(Chem. Abstr., (1936) 30, 5066^5).

115. L'HEUREUX, L.L. & BASTIN, R. "The starch of Ipomoea batatas and Ipomoea tuberosa".

15ème Congr. Chem. ind., (Bruxelles), (1936) 419-426.

The composition of the starches from Ipomoea batatas and Ipomoea tuberosa, on a dry weight basis, was found to be 0.14, 0.21 ash, 0.29, 0.25 fat, 0.7, 0.3 crude fibre, 0.35, 0.32 crude pentosans, 0.30, 0.07 crude protein.

116. HIRSCH, J.S.
MILLER, A.D. &
MEHLENBACHER, A.R.

"Essential amino-acid content of several vegetables".

Food Research (1952) 17, 442-447.

Using microbiological methods the essential amino-acid content of fresh sweet potatoes was found to be: 74.0% water, 6.32% N x 6.25, 0.1% phenylalanine, 0.092% leucine, 0.15% valine, 0.085% arginine, 0.042% methionine, 0.093% threonine, 0.040% histidine, 0.091% lysine, 0.063% iso-leucine, 0.035% tryptophan.

117. NISHIDA, K.

"Biochemical studies on Cycas revoluta Thumb".

VI. Removal of poisonous constituents in the seeds and the nutritive value of the seeds".

J. Agr. Chem. Soc. Japan, (1936) 12, 1106-1116.

The fresh seeds contain 0.164-0.220% formic acid which may be removed by washing. They may be eaten after boiling with water when they contain 70% starch and 12% protein on an air-dried basis. The protein has a low biological value.

(Chem. Abstr., (1937) 31, 26402).

118. HOLLINGER, M.E.

"Ascorbic acid value of the sweet potato as affected by variety, storage and cooking".

Food Research, (1944) 9, 76-82.

Ascorbic acid values are reported for two varieties of sweet potato. In these first months after harvesting these values ranged from 23.5 to 33.3 mg.%. After 7 months storage these values had dropped to 16.6 to 20.3 mg.%. 69 to 83% of the ascorbic acid was retained after cooking.

119. LOHIG, P.

"The non-sugars in cane juice".

Arch. Suikerind., (1934) 42, I, 249-257.

The non-sucrose material of cane juice consists of 10-25% ash, 50-66% reducing sugars, 2-6% soluble nitrogen compounds.

(Chem. Abstr., (1934) 28, 4262[8]).

120. HOOVER, H.A.

"The analysis of Ceylon foodstuffs. X. The mineral analysis of some local yams and vegetables".

Trop. Agriculturist, (Ceylon), (1941) 97, 185-187.

120. (Cont'd)

	Water %	Ash %	Protein %	Calcium mg%	Phosphorus mg%	Magnesium mg%	Iron mg%
Yam	55.4-76.2	0.59-0.88	2.05-2.65	2-9	54-62	11-19	-
Yellow sweet potato	62.1	1.1	2.35	25	30	36	-
Amaranthus polygonoides	85.9	-	4.3	595	74	228	5
Amaranthus viridis	87.3	-	3.5	540	87	221	6
Amaranthus gangeticus	85.2	-	4.3	517	92	218	7
Ipomoea aquatica	85.5	-	5.06	132	38	35	5
Sesbania grandiflora	82.3	-	6.16	302	74	82	4

121. HSUEH-CHUNG KAO, ADOLPH, W.H. & HSI-CHEN LIN

"The nutritive value of the protein of cabbage and of sweet potato.

Chinese J. Physiol., (1935) 9, 141-148.

Proteins prepared from cabbage (Brassica pekinensis) and sweet potato (Ipomoea batatas) were studied by the N-balance method of Mitchell on rats. The biological values were for potato 72 and for cabbage 76. Both proteins were found inferior to casein in growth experiments. Determinations on the proteins are reported for arginine, histidine, lysine, tryptophan and cystine.

(Chem. Abstr., (1935) 29, 5895^5).

122. van HULSSEN, C.J. & KOOLHAAS, D.R.

"Composition of several species of Dutch Indian Amorphophallus".

Ing. Nederland-Indie, (1940) 7, 29-35.

Chem. Weekblad, (1940) 37, 442-446.

An analysis of Amorphophallus camponulatus gave 2.7% mannan, 7.8% cellulose, 5.8% lignin, 3.1% pentosans, 54.9% starch, 6.2% sugars, 8.9% protein, 5% ash and 0.8% fats.

(Chem. Abstr., (1941) 35, 4415^5).

123. IKEMIYA, M.

"Biochemical studies on sweet potatoes. II. Changes of the constituents during preservation".

J. Fermentation Technology (Japan), (1950) 28, 392-395.

Sweet potatoes were kept for eight months. The water content remained constant until germination during the 5th month, and then decreased. The total sugars

123. (Cont'd.) increased to a maximum at the time of germination and then decreased. Starch decreased 10% in the first four months and 23% during the last four months.

124. I[illegible]A I. S. & KUGA, T.

"Studies on sweet potatoes rich in carotene".

Rep. nat. Inst. Nutrit. Tokyo, (1951-1952) 43-44.

No correlation was observed between the carotene and sugar contents of different tubers of a carotene-rich variety of sweet potato.

(Food Sci. Abstr., (1955) 27, 318.

125. INTENGAN, C.Ll., ALEJO, L.C., CONCEPCION, I., YAPINCHAY, C., POBRE, V.L., SALUD, R.D. & HAMALO, J.D.

"Composition of Philippine foods. I."

Philipp. J. Sci., (1953) 82, 227-252.

The values for Philippine foods include:

(See page 37).

126. INTENGAN, C.Ll., CONCEPCION, I., ALEJO, L.C., CORPUS, V.A., SALUD, R.D. del ROSARIO, I., GOMEZ, R. & HENSON, J.

"The composition of Philippine foods. IV".

Philipp. J. Sci., (1954) 84, 343-364.

124 samples were examined including the ones showing on page 38.

127. INTENGAN, C.Ll., CONCEPCION, I., SALUD, R.D., HAMALO, J. del ROSARIO, I., GOMEZ, R., ARZACA, V. & ALEJO, L.C.

"Composition of Philippine foods. II".

Philipp. J. Sci., (1954) 83, 187-216.

167 samples were examined, including the ones showing on page 39.

128. ISHII, M.

"The carotenoids and some lipoids of Ipomoea reptans (L.) Poir".

J. Soc. Trop. Agr. (Nettai Nôgaku Kwaishi), (1933) 5, No. 2, 192-197.

On a dry weight basis Ipomoea reptans contains 5.5% ether extract, 5% total N. and 14.3% crude fibre, 0.033% β-carotene.

(Chem. Abstr., (1935) 29, 3376[1]).

125. (Cont'd)

	Edible portion %	Wate %
Amaranthus spinosus	-	80.
Anona reticulata	47.9	63.
Anona squamosa	50.2	72.
Anona muricata	73.5	84.
Artocarpus altilis	80.2	78.
Carica papaya	47.3	88.
Colocasia esculentum (leaves)	-	57.
Ipomoea batatas yellow	88.5	62.
white	85.7	76.
Ipomoea reptans (leaves)	59.3	89.
Mangifera indica	71.0-73.2	80.7 84.
Momordica charantia	81.7	94.
Musa sapientum var. cinerea	73.7	67.
var. lacatan	66.5	66.
var. violacea	68.6	76.

127. (Cont'd)

	Edible portion %	Water %	Nitrogen %	Ether extract %
Mangifera indica L. green fruit	75.2	82.3	0.99	0.06
Mangifera indica L. ripe fruit	48.0	79.0	0.169	0.48
" "	59.4	82.7	0.154	0.08
Momordica charantia tops	46.5-52.7	82.5-86.8	0.738-1.042	0.47-0.85
Musa sapientum	53.5-61.0	62.6-70.1	0.149-0.191	0.07-0.47
Passiflora foetida L.	60.3	-	-	-
Portulaca aleracea leaves	35.7	90.2	0.342	0.55
Portulaca aleracea leaves	35.7	84.8	0.501	0.54
Sesbania grandiflora flowers	78.8	89.0	0.289	0.49
Syzygium cumini	67.8	84.8	0.099	0.13
Syzygium malaccense	89.3	91.1	0.066	0.10
Tetragonia expansa	40.8	88.6	0.648	0.45

Ash %	Crude fibre %	Calcium mg%	Phosphorus mg%	Iron mg%	Carotene mg%	Thiamine mg%	Riboflavin mg%	Niacin mg%	Ascorbic acid mg%
0.32	.5	13.1	10.5	.35	0.082	0.039	0.042	0.32	81
0.44	.3	7.7	10.4	.26	1.147	0.125	0.155	0.90	27
0.38	0.4	10.1	13.6	0.54	4.179	0.073	0.085	0.67	40
1.66-2.61	1.3-1.8	280.2-297.0	53.0-54.7	3.27-.05	4.592-5.575	0.123-0.141	0.374-0.549	1.25-1.85	130-210
0.65-0.97	0.2-0.3	10.8-20.9	15.5-34.8	.5 -.80	0.059-0.581	0.029-0.076	0.024-0.055	0.61-0.73	9-42
1.18	-	9.5	60.3	.7	-	0 002	0.077	-	-
1.88	1.0	102.7	41.2	31.39	3.164	0.042	0.106	0.90	56
2.07	1.2	106.8	30.5	.65	.031	0.83	0.217	1.12	69
0.49	1.3	17.8	27.1	0.59	0.758	0.147	0.119	3.39	59
0.33	0.3	13.9	11.8	0.15	nil	0.007	0.018	0.31	-
0.24	0.9	15.2	7.7	0.23	nil	0.029	0.018	0.29	15.0
2.16	1.0	375.9	68.0	2.48	7.643	0.031	0.188	1.49	36

129. IWASAKI, Y.

"Storage of sweet potatoes".

Nogaku, (1947) 1, 470-474.

A review with 10 references.

(Chem. Abstr., (1950) 44, 2139d).

130. JACKSON, W.R.C. & MACEK, T.J.

"B-complex vitamins in sugar cane and sugar cane juice".

Ind. Eng. Chem., (1944) 36, 216-223.

Sugar cane and sugar cane juices from Louisiana and Cuban canes were examined for their sucrose and vitamin B content. Louisiana cane contained 11.5% sucrose and Cuban cane 12.3% sucrose. The B vitamin content was:

	Thiamin	Riboflavin	Pantothenic acid	Nicotinic acid	Biotin
	(mg per lb of sucrose)				
Louisiana cane	1.57	0.92	13.73	5.39	0.15
" juice	0.29	0.17	12.03	2.68	0.09
Cuban cane	2.05	1.07	6.03	6.77	0.20
" juice	0.46	0.22	4.42	1.99	0.12

(Chem. Abstr., (1944) 38, 2231[2]).

131. JACQUOT, R., RAULIN, J., ADRIAN, J. & RERAT, A.

"Composition et valeur alimentaire des larmes de Job (Coix lacryma-jobi). (Composition and nutritive value of Job's tears (Coix lacryma-jobi)".

J. Rech. C.N.R.S., (1955) 30, 147-155.

A full survey of the nutritive value of Job's tears is given. A composition of the seed is given as 12.5% water, 1.9% ash, 15.0% protein, 7.3% fat, 60.4% starch, 2.9% fibre, 0.25% phosphorus, and 0.07% calcium. The following amino-acid composition is reported (16% N): 3.5% arginine, 1.8% cystine, 2.15% histidine, 7.2% isoleucine, 23.7% leucine, 2.45% lysine, 3.1% methionine, 4.75% phenylalanine, 4.2% threonine and 0.45% tryptophan. The vitamin content is reported to be (mg%) nil vitamin A, nil ascorbic acid, 0.295 thiamine, 0.26 riboflavin, 6.3 niacin, 0.75 pantothenic acid, 0.004 pyridoxin and 0.0009 biotin. (30 references).

132. JAMIESON, G.S. & McKINNEY, R.S.

"Passionfruit seed oil".

Oil & Soap, (1934) 11, 193.

Passionfruit (Passiflora edulis) seeds contained 18.17% oil which had d_{25°, n_{25°, 1.4737, Hanus iodine No. 140.4,

132. (Cont'd)

thiocyanogin no. 81.2%, saponification value 190.4, Reichert. Miesal value 0.11, Polenske no. 0.21, acetyl value 8.1, unsaponifiable matter 0.62%, saturated acids 8.88%, and unsaturated acids 84.31%. The percentage fatty acis as glycerides was found to be 19.9% oleic, 62.3% linoleic, 5.6% linolenic, 7.1% palmitic, 1.8% stearic, and 0.4% arachidic acids.

133. JEWELL, M.R.

"Chemical composition of passionfruit (Passiflora edulis)".

J. Dep. Agric. Vict., (1933) 31, 609.

The results obtained on a sample of 24 fruits were:

	Pulp		Whole fruit	
	Fresh %	Dry %	Fresh %	Dry %
Water	70.4	-	-	-
Ash	0.72	2.43	1.19	4.76
N x 6.25	2.9	9.9	-	-
Fat	2.1	7.0	-	-
Fibre	7.7	26.0	-	-
Reducing sugars	7.6	25.5	-	-
Non-reducing sugars	1.6	5.4	-	-
Starch (differ.)	4.2	14.3	-	-
SiO_2	0.01	0.04	0.01	0.04
P_2O_5	0.16	0.55	0.11	0.44
$Fe_2O_3 + Al_2O_3$	0.02	0.08	0.02	0.08
CaO	0.012	0.041	0.03	0.12
MgO	0.057	0.19	0.051	0.02
K_2O	0.31	1.05	0.60	2.40
Na_2O	0.024	0.08	0.024	0.1
Cl	0.005	0.18	0.1	0.4

134. JAYARAM, A.M.R. & JAYAVARDANA, C.

"The analysis of Ceylon foodstuffs IV. The vitamin C contents of some Ceylon fruits and vegetables".

Trop. Agriculturist (Ceylon), (1933) 90, 17-21.

Included in the analytical results are ascorbic acid contents of Anona sp., jackfruit, pawpaw, eugenia and mango. These results are:

Anona muricata	15.0 mg%
Anona squamosa	16.0
Artocarpus integra	7.0
Carica papaya fruit	61.0
Eugenia sp.	11.0
Mango (six varieties)	15.0-80.0

135. JOACHIM, A.W.R. & PANDITTESEKERE, D.G. "The analysis of Ceylon foodstuffs. II. Some important cereals, pulses, oil seeds and roots".

Trop. Agriculturist (Ceylon), (1933) 90, 7-10.

Jackfruit seeds, Job's tears, yam and sweet potato gave the following analyses:

		Jackfruit seeds	Job's tears	Yam	Sweet potato
Water	%	52.10	10.77	71.23	81.01
Protein	%	4.62	8.87	1.73	1.40
Carbohydrate	%	41.20	70.34	25.45	15.99
Ether extract	%	0.66	5.56	0.03	0.22
Fibre	%	0.16	0.83	0.62	0.17
Ash	%	1.26	3.63	0.96	1.21

136. JOACHIM, A.W.R. & PANDITTESEKERE, D.G. "The analysis of Ceylon foodstuffs. VI. The more important fruits of the island".

Trop. Agriculturist (Ceylon), (1939) 93, 330-335.

Foods analysed included two varieties of mango fruit; the flesh of the jackfruit, the fruits of Anona sp., papaya and two varieties of plantain. The results obtained for these fruits were:

		Musa paradisica	Anona squamosa	Anona reticulata	Anona muricata	Artocarpus integrifolia	Mangifera indica	Carica papaya
Edible portion	%	(72 (69	47	41	69	31	(56 (54	67.0
Water	%	(65.9 (73.6	76.4	66.4	82.4	68.8	(85.9 (80.0	85.1
Protein	%	(1.28 (1.09	2.09	2.06	0.88	1.81	(0.62 (1.08	0.39
Total carbohydrates	%	(31.7 (24.4	20.44	29.41	14.97	27.54	(12.70 (17.09	14.06
Reducing sugars	%	(14.4 (13.0	7.3	6.8	6.2	4.0	(3.5 (4.7	1.0
Ether extract	%	(0.21 (0.14	0.24	0.54	0.19	0.29	(0.07 (0.20	0.07
Fibre	%	- -	-	-	0.78	0.65	(0.27 (0.23	-
Ash	%	(0.90 (0.73	0.88	1.59	0.78	0.91	(0.44 (0.40	0.38
Calcium	%	(9.9 (13.4	17.8	64.1	19.4	16.9	(19.3 (24.0	18.8
Phosphorus	%	(19.5 (15.8	14.1	19.9	31.9	17.0	(7.4 (20.9	6.3

138. JACHIM A.W.R. & PATTERSON D.G. "The analysis of Ceylon foodstuffs. VIII. (A). Further investigations on the vitamin C contents of local fruits, fruit products and vegetables".

Trop. Agriculturist (Ceylon), (1940) 95, 136-140.

Two varieties of passionfruit (no botanical name given) were analysed for ascorbic acid content.

Purple variety	
flesh and seeds	13.9 mg%
juice	19.5 mg%
Yellow variety	
flesh and seeds	8.9-13.3 mg%
juice	1 .5-17.6 mg%

139. JONES, L.R., LARSEN, N.P. & RICHARD, M.F. "Taro and sweet potatoes versus grain foods in relation to health and dental decay in Hawaii".

Dental Cosmos, (1943) 76, 395-409.

When 30-40% of the total caloric intake is in the form of grain foods, the potential alkalinity of the diet is equal to only 6-10 cc. normal alkali daily, the CO_2 combining power of the blood plasma is low (50-60 vol.%), the urinary acidity is high (pH 5.0-6.0), and certain diseases including dental caries show a high incidence. When roots and tubers (taro or poi and sweet potatoes) replace grains as the source of carbohydrates in the diet, its potential alkalinity is 36-45 cc. normal alkali daily, and the incidence of these diseases including dental caries is mardedly reduced.

(Chem. Abstr., (1934) 28, 4771[7]).

139. JONES, W.W. "Harvesting, marketing and uses of papaya".

Hawaii Agric. Exp. Sta., Bull., (1941) 87, 52-60.

The following figures for green, firm ripe and ripe papayas are given:

Stage of maturity:		Green	Firm-ripe	Ripe
Water (fresh-weight basis)	%	86.1	86.1	85.3
Soluble solids*	%	10.49	10.67	11.56
Glucose*	%	40.70	62.23	62.64
Total sugar*	%	71.68	74.64	79.04
Total nitrogen*	%	0.59	0.66	0.53
Calcium pectate*	%	6.53	5.99	6.35
Acid-hydrolysable material*	%	9.35	4.74	4.36
Sucrose*	%	9.96	12.41	14.40

* dry weight basis

140. JUKES, T.H. "The distribution of pantothenic acid in certain products of natural origin".

J. Nutrition, (1941) 21, 193-200.

Pantothenic acid was assayed by the chick growth method. The content of the following foods was found to be on a dry weight basis:

Sweet potatoes	3.8 mg%
Taro	2.8 "
Banana	0.4 "

141. KANDIAH, S. & KOCH, D.E.V. "The analysis of Ceylon foodstuffs. III. Some leafy and non-leafy vegetables".

Trop. Agriculturist, (Ceylon), (1933) 90, 11-16.

The results given include the following:

	Water %	Protein %	Ether extract %	Carbo-hydrate %	Fibre %	Ash %	Calcium mg%	Phos-phorus mg%	Iron mg%
Amaranthus paniculatus leaves	87.14	4.53	0.19	3.28	2.08	2.80	258	76	9.2
Amaranthus viridis leaves	87.45	3.46	0.18	4.97	1.31	2.63	295	70	6.3
Artocarpus integra young fruit	86.45	1.78	0.47	8.89	1.65	0.76	-	-	-
mature fruit	67.83	2.33	0.12	27.76	0.90	1.06	-	-	-
Artocarpus communis fruit	73.70	1.94	0.51	21.95	1.11	0.79	-	-	-
Sesbania grandiflora leaves	78.97	7.03	0.54	9.83	1.19	2.44	49	722	7.7
Sesbania grandiflora flowers	88.94	1.67	0.20	7.01	1.46	0.72	-	-	-
Ipomoea aquatica leaves	86.51	4.41	0.45	5.70	1.57	1.36	64	23	2.95
Musa paradisiaca fruit	73.4	0.69	0.29	24.18	0.47	0.97	-	-	-

142. KAO, HSUEH-CHUNG. ADOLPH, W.H. & LIU, HSI-CHE.

"The nutritive value of the protein of cabbage and of sweet potato".

Chinese J. Physiol., (1935) 9, 141-148.

Proteins prepared from Ipomoea batatas showed a biological value of 72 (rat growth); figures for the arginine, histidine, lysine, tryptophan and cystine content are given.

(Chem. Abstr., (1935) 29, 5895[5]).

143. KAR, A.R.

"Chemical composition and nutritive value of bananas".

Science and Culture, (1938) 4, 76-84.

Ripe banana contains 3.5% fructose, 4.5% glucose, 11.9% sucrose, 0.6% fat, and 0.8% ash. Ca, Cu, Mg, Mn and Fe are present in the ash. The unripe banana is high in starch, low in sugar. The astringent taste is due to tannin, which precipitates during ripening.

(Chem. Abstr., (1939) 33, 2544).

144. KAUFMAN, E. & CORTES, H.

"Vitamin B_1 content of Cuban fruits".

Inform. méd. (Cuba), (1946) 10, 66-68.

Analyses of 29 fruits are given.

(Chem. Abstr., (1947) 41, 1343c).

145. KELWAY BAMBER, M.

"Some Ceylon foodstuffs and their food values".

Trop. Agriculturist (Ceylon), (1921) 56, 199-202.

A sample of sago flour analysed at 11.7% water, 0.13% albumoids, 87.56% starch, 0.13% fat, 0.13% fibre and 0.3% ash.

146. KEMERER, A.R., FRAPS, G.S. & KELLE, W.W.

"Constituents of the crude carotene of certain human foods".

Food Research, (1945) 10, 66-71.

The total carotene of sweet potatoes was shown to contain 86% α-carotene, 4% neo α-carotene B.

147. KIHARA, Y.

"Sweet potatoes. Their processing and components".

Nagaku, (1947) 1, 463-467.

A collection of analytical data.

(Chem. Abstr., (1950) 44, 2139d).

147a. KIHARA, Y. & KAWASE, Z.

"Digestibility of starch and starchy foods".

Rept. Food Research Inst., (Japan), (1949) 2, 25-35.

The degree of digestion of starch after treatment for two weeks with takadiastase was found to be: tapioca 56.2%, Dioscorea japonica 53.7%, sago 22.4%, Pueraria hirsuta 21.9%, and sweet potato 15.1%.

(Chem. Abstr., (1953) 47, 7126i).

148. KIMZO KAFUKU, CHIUTA HATA & MASAICHI FUJIKAWA

"Formosan plant seed oils".

J. Chem. Soc. Japan, (1932) 53, 115-119.

The properties and constants of the oil of Passiflora edulis Sims. seeds are given.

(Chem. Abstr., (1933) 27, 1533[1]).

149. KINSUKE KONDO

"Taros as food material".

Bull. Res. Inst. Food Sci., Kyoto Univ., (1951) No. 5, 1-8.

The composition of taros has been determined. They contain 8-9% globulin and are a good source of vitamins B_1 and C, minerals such as K, P, and Ca. The amounts of nutrients and calorific values of taros were compared with those of rice, wheat, soybean, potato and sweet potato with regard to their yields per ton (about $\frac{1}{4}$ acre).

(Chem. Abstr., (1952) 10, 4696f).

150. KIRKPATRICK, R.M.

"Diet in relation to gingivitis: field observations in New Guinea".

J. Amer. Dent. Ass., (1937) 24, 197-206.

A report on a survey of the taro and sago eating tribes of Manus Island. An analysis of steamed taro is given as 63.6% water, 1.7% protein, 0.41% fat, 0.94% ash, 0.119% P_2O_5, 0.032% CaO, and 33.199% (difference) carbohydrate. An analysis of sago is given as: 1.2% protein, 0.6% fat, and 83.5% carbohydrate. It was found that natives living on a taro diet had better developed dental arches and a lower incidence of acute and subacute Vincent gingivitis.

151. KOENIG, P.

"The Egyptian banana".

Ernakr. Pflanze, (1929) 25, 445-448.

Figures are given for the protein N, fat, fibre, sugar and ash of Musa sapientium L. and for the percentage of P_2O_5, Ca O, K_2O and Fe_2O_3 in the ash.

(Chem. Abstr., (1930) 24, 665[8]).

152. KWOH, TSUIN-HO, LEE, CHUNG-HUA & SUN, TSON-PEN

"The carotene content of some Chinese fruits and vegetables".

J. Chinese Chem. Soc., (1941) 8, 54-59.

The carotene content of the leaves of Ipomoea aquatica and green amaranth are given as 5.6 and 5.2 mg.% respectively.

(Chem. Abstr., (1943) 37, 192^{6}).

153. LANGWORTHY, C.P. & DEVEL, H.J. Jr.

"Digestibility of raw rice, arrowroot, canna, cassava, taro, tree-fern and potato starches".

J. Biol. Chem., (1922) 52, 251.

(Feingold, B.F.: J. Allergy, (1942) 13, 493.

154. LANTZING, J.C. & van VEEN, A.G.

"Over het provitamine A-gehalte van verschillende plantaardige voedings-middelen. (The provitamin A content of different plant foodstuffs)".

Geneeskund. Tijdschr. Nederland-Indie, (1937) 77, 2777-2804.

The provitamin A content of the following foods was found to be:

Musa paradisiaca 1000-2500, Carica papaya 650-3000, Artocarpus integrifolia 300, Ipomoea batatas 2500-13,500 I.U./100 g.

155. LAVOLLAY, J.

"La banane. Sa composition chimique envisagée du point de vue alimentaire. (The banana. Its composition from the nutritional point of view)".

A review article on the nutritive value of the banana. General composition figures are given which have been compiled from the literature.

156. LEASE, E.J.

"Sweet potatoes as a source of vitamin A for man and domestic animals".

Proc. Assoc. Southern Agr. Workers, (1941) 42, 162-163.

The carotene of sweet potatoes was used as efficiently by rats as an equivalent amount of pure crystalline carotene dissolved in oil.

(Chem. Abstr., (1941) 35, 7479^{8}).

157. LECLERC, H. "Le chou caraïbe. (Xanthosoma sagittifolium Schott)".

Pr. méd., Paris, (1937) 45, 1094.

A general survey of the properties and uses of Xanthosoma in the Caribbean. The tuber is said to contain 1.35% nitrogen, 0.276% fat and 17.70% carbohydrate.

158. LEHRMAN, L. "Fatty acids associated with cassava starch".

J. Am. Chem. Soc., (1932) 54, 2527-2530.

Palmitic, oleic, linoleic and linolenic acids have been found after the hydrolysis of defatted cassava starch.

159. LEHRMAN, L. & KABAT, E.A. "Fatty acids associated with banana starch".

J. Am. Chem. Soc., (1937) 59, 1050-1051.

Palmitic, oleic, linoleic and linolenic acids and phytosterol have been shown to be present to a total of 0.2% after hydrolysis of defatted banana flour.

160. LEITO, R.A. "Determination of assimilable iron in foods".

Arquiv. inst. biol. exercito (Rio de Janeiro), (1948) 9, 84-86.

Sweet potato was shown to contain 0.65 mg% reduced iron and 0.90 mg.% total iron, whilst watercress contained 1.90 mg.% reduced and 2.30 mg.% total iron.

(Chem. Abstr., (1950) 44, 235h).

161. LEONG, P.C. "The vitamin A content of Malayan bananas".

J. Malayan Branch Brit. Med. Assoc., (1939) 3, 156-161.

Seventeen varieties of bananas were studied and found to contain between 30 and 700 I.U. per 100 g. vitamin A.

(Chem. Abstr., (1940) 34, 3837[8]).

162. LEONG, P.C. "Vitamin B (thiamine) content of foods".

J. Malayan Branch Brit. Med. Assoc., (1940) 4, 66-107.

The thiamin content of a large number of foods was determined and is listed.

(Chem. Abstr., (1940) 34, 1019[8]).

163. LEONG, P.C. "Riboflavin content of foods".

Med. J. Malaya, (1947) 2, 148-156.

The riboflavin values of a large number of Malayan foods are listed.

(Chem. Abstr., (1950) 44, 8549h).

164. LEVERTON, R.M. "Ascorbic acid content of bananas at three stages during ripening".

Food Research, (1937) 2, 59-63.

Green, yellow and fully ripe bananas showed 6.1, 6.3, and 7.3 mg.% ascorbic acid.

(Chem. Abstr., (1937) 31, 5051^8).

165. de LIZ GRILO ABREU VELHO, H. "Composicao quimica de alguns produtos de origem vegetal utilizados na alimentacao dos indigenos. (Chemical composition of some products of plant origin used as food by natives)."

An. Inst. Med. Trop., Lisboa, (1953) 10, 1563-1583.

The general nutritional problems of Angola are discussed.

Analyses are included among which is an analysis of six samples of sweet potato. The mean results were: 62.5% water, 1.56% protein, 35.6% carbohydrate, 0.4% fat, 0.9% crude fibre, and 1.0% ash.

166. LOPEZ BORGES, H. "Study of vitamin B_1 in some Cuban foodstuffs".

Salubridad y asistencia social (Havana), (1943) 46, 140-183.

Vitamin B_1 was detailed according to U.S.P. XII by observation of the increase in weight of rats. Rice bran contained 1,297.3 γ thiamine per 100 g., green bananas 164.75, ripe bananas (2 varieties) 105.0-122.0, avocados 318.75, potatoes 245.0, and sweet potatoes 430.0 γ.

(Chem. Abstr., (1944) 38, 5013^4).

167. LOVELAND, R.M. "An investigation of the iodine content of some Hawaiian food products".

Univ. of Hawaii Thesis, 1933.

Iodine content of Hawaii-grown vegetables and other food products was determined. Investigation deals extensively with historical material and with description of analytical methods and apparatus. Iodine content

167. (Cont'd)

of 27 Hawaii foods investigated is sufficient to meet the needs of normal animal metabolism. Representative foods used are: avocado, beets, cabbage, lotus root, opihi, Chinese peas, and yams.

(Fanning, R.J.: Pacific Islands Nutrition Bibliography, (1951) p. 24, University of Hawaii Press).

168. LYNCH, S.J. & FIFIELD, W.M.

"Some chemical constituents of papayas and their relation to flavour".

Proc. Krome Memorial Inst., 8 : In Proc. Florida State Hort. Soc., (1940) 53, 181-184.

Sweet tasting and flat tasting fruits contained respectively, 8.09%, 5.41% total sugars, 5.38%, 4.49% free reducing sugars, and 2.77%, 0.92% hydrolyzable sugars. There were only negligible differences in the acid, moisture and ash contents. Analyses of one variety, Betty, which averaged 6.03% total sugars, indicated that the sugar content was sufficiently constant, to be used as a measure of sweetness.

(Chem. Abstr., (1941) 35, 1135^{9}).

169. MacCAUGHEY, V.

"The Hawaiian taro as food".

Hawaii. For. Agric., (1917) 14, 265-268.

A general description of the distribution and uses of taro in Hawaii. A chemical analysis, 34.12% starch, 1.08% sugar, 1.06% fat, 0.72% protein, 0.67% ash, 0.50% crude fibre and 59.0% water is given.

170. MacGILLIVRAY, J.H., PERDUE, J.W. & YAMAGUCHI, M.

"Food value of some minor California vegetable crops".

Univ. Calif. Agr. Expt. Sta., Truck crops, Mimeo., (1952), No. 53, 11 pp.

Nutrients per 100 g. are given for Californian foods including New Zealand spinach (Tetragona expansa).

(Chem. Abstr., (1952) 46, 5742e).

171. McLAUGHLIN, L.

"The nutritive value of New Zealand spinach".

J. Nutrition (1929) 2, 197-202.

New Zealand spinach compares favourably with other green vegetables.

172. MacLEOD. F.L.

"Content of vitamin A in sweet potato varieties".

Tenn. Agr. Expt. Sta., Ann. Rept., (1933) 43-44.

(Chem. Abstr., (1936) 30, 1454^{6}).

173. MAKSUZAWA, K., I.NAI, S. & KUGA, T.

"Studies on sweet potatoes rich in carotene. II".

Rep. nat. Inst. Nutrit., Tokyo, (1951-1952), 42-45.

The moisture, protein, sugar, starch, fat, fibre and ash content of carotene rich varieties of sweet potato are given.

(Food Sci. Abstr., (1955) 27, 317.

174. MARIANETTI, V.

"Vitamin content of some fruits of Bahia (Brazil)".

Rev. Brazil. farm., (1951) 32, 159-164.

The vitamin C content of various fruits, in mg./ml., were: genipapo, 2.04, goiaba 0.85, caja-manga 0.72, mamao 0.67, Bahia orange 0.64, roma 0.57, manga Carlota 0.56, lima de umbigo 0.55, lima da Persia 0.47, manga rosa 0.44, lemon 0.38, manga espada 0.36, tangerine 0.30, banana 0.23, and sapoti 0.13. The caju is known to have a high content of vitamin C, but was not available when these tests were carried out.

(Chem. Abstr., (1952) 46, 6215i).

175. MARTIN, W.S. & GRIFFITH, G.

"Composition of Uganda foodstuffs".

Ann. rept. Dept. Agr. Uganda Protectorate, (1938) pt. 2, 50-56.

Data is given for the percentage of moisture, protein, fat, fibre, sugars, ash, P, K and Ca in plantains, sweet potato, and cassava.

(Chem. Abstr., (1938) 32, 5557^{6}).

176. MARTINEZ, J.R.

"Comparative mineral contents of Philippine bananas. Calcium, iron, magnesium and phosphorus".

Philippine Agri., (1953) 21, 547-550.

Ten varieties of Philippine bananas were examined and found to contain: 0.74-1.27% ash, 56-76% water, 0.004-0.021% CaO, 0.003-0.18% Fe_2O_3, 0.031-0.210% MgO and 0.109-0.294% P_2O_5.

177. MURTHY, H.B.N. & SWAMINATHAN, M.

"Nutritive value of different varieties of sweet potato".

Current Sci., (India), (1954) 23, 14.

Various varieties of sweet potato were analysed for moisture, protein, fat, fibre, minerals, carbohydrate, calorific value, Ca, P, and carotene. American varieties are very rich in carotene in contrast to the Indian varieties which are completely devoid of this factor. The introduction of American varieties should help to improve the nutritional quality of the the Indian diet, particularly with respect to the vitamin A content.

178. MATSUZAWA, K., INNAMI, S. & KUGA, T.

"Studies on sweet potatoes rich in carotene. I".

Rep. nat. Inst. Nutrit., Tokyo, (1951-1952) 40-42. (In English).

Carotene rich varieties of sweet potato contained up to 9.747 µg of carotene per 100 g. of tuber. The carotene content of individual tubers of any one variety showed wide variations.

(Food Science Abstracts, (1955) 27, 317).

179. MILES, I.E. & CROSS, E.E.

"Compilation of information on Kudzu, Pueraria thunbergiana".

Miss. Agr. Expt. Sta., Bull., (1939) 326, 3-14.

(Chem. Abstr., (1940) 34, 20919).

180. MILLER, C.D.

"The vitamins (A, B_1 and C) of papaya".

Biochem. J., (1926) XX, 515-518.

Vitamin content of papaya determined by biological methods showed it to be fair source of vitamin B_1, good source of A, and excellent source of C.

(Fanning R.J.: Pacific Islands Nutrition Bibliography, (1951) p. 28, University of Hawaii Press).

181. MILLER, C.D.

"Food values of poi, taro and limu".

Bernice P. Bishop Mus. Bull., (1927) 37, 25 pp.

A survey of the history and uses of these foods in Hawaii. An analysis of steamed taro is given as, 64.0% water, 1.18% N x 6.25, 0.169% ether extract, 29.31% starch (acid hydrolysis), 1.4% sucrose, 0.391% reducing sugars, 0.588% ash, 0.0263% calcium, and 0.0612% phosphorus.
Values are also given for vitamins A, B and C, determined by biological means.

182. MILLER, C.D.

"Food values of breadfruit, taro leaves, coconut and sugar cane".

Bernice P. Bishop Mus. Bull., (1929) No. 64, 23 pp.

(Fanning, R.J.: Pacific Islands Nutrition Bibliography, (1951) p. 29, University of Hawaii Press).

183 MILLER, C.D. "The vitamins".

Univ. Hawaii Occas. Papers (1932) No. 16, 9 pp.

(Fanning, R.J.: Pacific Islands Nutrition Bibliography, (1951) p. 29, University of Hawaii Press).

184. MILLER, C.D. "The vitamin assays of foods used in Hawaii".

Proc. Pacific Sci. Congr., Pacific Sci. Assoc., (1943) 6, 403-406.

A general survey of the vitamin assay work that has been carried out in Hawaii. It is suggested that more work be done on the thiamine values of the foods.

185. MILLER, C.D. "The availability of iron in Hawaiian grown vegetables".

J. Nutrition, (1945) 16, 485-494.

The availability of iron in 15 Hawaiian-grown vegetables and one sea-weed was determined.
Taro corms and leaves were shown to have a high percentage of available iron.

(Fanning, R.J.: Pacific Islands Nutrition Bibliography. (1951) p. 34, University of Hawaii Press).

186. MILLER, C.D., BAZORE, & ROBBINS, R.C. "Some fruits of Hawaii, their composition, nutritive value and use".

Hawaii Agr. Expt. Sta. Bull., (1936) No. 77, 129 pp.

Information on the most important and widely used Hawaiian fruits. Analyses of local fruits show them to be similar in composition to the same varieties grown elsewhere.

(Fanning, R.J.: Pacific Islands Nutrition Bibliography, (1951) p. 30, University of Hawaii Press).

187. MILLER, C.D., BRANTHOOVER, B., SEKIGUCHI, M., DENNING, H. & BAUER, A. "Vitamin values of foods used in Hawaii".

Hawaii Agr. Expt. Sta. Tech. Bull., (1956) No. 30, 94 pp.

Results are reported for 285 foods used in Hawaii. Special studies are reported on the vitamin content of different varieties, the changes in ascorbic acid content during maturation and ascorbic acid content of foods under different cooking and marketing conditions. Some of the results presented are:

187. (Cont'd)

	Water %	Carotene mg%	Thiamine mg%	Riboflavin mg%	Niacin mg%	Ascorbic acid mg%
Amaranthus sp.						
raw	92.4	1.890	0.030	0.143	0.74	24
cooked	92.3	2.542	0.011	0.146	0.84	12
Anona muricata	82.2	nil	0.067	0.120	1.52	16
Artocarpus incisus						
green, raw	69.3	nil	0.125	0.055	0.88	17
cooked	69.2	nil	0.122	0.058	0.67	10
ripe, raw	67.3	0.035	0.099	0.054	1.32	13
cooked	65.2	0.026	0.109	0.056	1.31	10
Carica papaya						
common	87.6	-	0.039	0.030	0.37	83
hermaphrodyte	87.4	1.047	0.025	0.041	0.32	84
pistillate	85.9	-	0.021	0.041	0.32	-
Colocasia esculenta						
leaves raw	80.5-82.5	3.100-5.688	0.168-0.230	0.440-0.464	1.34-1.60	52
cooked	81.4-83.6	3.282-5.718	0.131-0.173	0.415-0.539	1.24-1.56	43
corms raw	58.4-62.6	-	0.174-0.210	0.026-0.030	0.61-0.66	5
cooked	59.6-74.3	-	0.090-0.111	0.025-0.030	0.41-0.57	5
Colocasia esculenta var. globulifera						
raw	74.4	trace	0.065	0.018	0.64	4
cooked	74.9	trace	0.047	0.016	0.60	4
Dioscorea pentaphylla raw	90.6	-	0.036	0.018	0.33	trace
cooked	86.8	-	0.035	0.018	0.26	2.8
Eugenia cumini	84.9	nil	trace	-	0.24	27
Eugenia malaccensis	91.4	nil	0.029	0.036	0.24	23
Eugenia uniflora	89.0	1.120	0.024	0.054	0.23	19
Ipomoea batatas						
raw	68.8-72.8	0.474-4.878	0.102-0.123	0.027-0.038	0.46-0.64	21
cooked	67.3-77.3	0.323-5.387	0.091-0.118	0.030-0.039	0.39-0.58	13
tops raw	-	0.941-1.203	0.132-0.184	0.297-0.440	1.06-1.23	11
cooked	86.6-88.5	1.386-2.958	0.114-0.150	0.283-0.336	1.07-1.24	2
Ipomoea reptans raw	93.2	1.261	0.057	0.126	0.59	44
cooked	92.5	2.024	0.053	0.129	0.74	10
Mangifera indica						
green	84.0	nil	0.035	0.049	0.23	61-188
ripe	81.1-89.5	1.639-3.085	0.027-0.053	0.038-0.059	0.20-0.52	10-142
Musa paradisiaca bud	90	0.043	trace	0.021	0.59	1

187. (Cont'd)

	Water %	Carotene mg%	Thiamine mg%	Riboflavin mg%	Niacin mg%	Ascorbic acid mg%
Musa paradisiaca	66.2	trace	0.026	0.038	0.45	6
var. sapientum	79.2	0.085	0.043	0.080	0.61	18
Musa paradisiaca var. normalis raw	64.5-69.1	0.114-0.716	0.042-0.057	0.050-0.067	0.63-0.83	11-15
cooked	66.6-70.9	0.137-0.488	0.033-0.050	0.051-0.074	0.54-0.69	10-15
Passiflora edulis						
purple	85.6	0.717	trace	0.131	1.46	30
yellow	85.0	2.410	trace	0.101	2.24	20
Portulaca oleracea						
raw	91.3	1.320	0.047	0.112	0.46	21
cooked	90.7	2.051	0.034	0.100	0.52	12
Spondias cytherea or dulcis	85.9	0.360	0.052	0.015	1.33	51
Sesbania grandiflora flowers						
raw	89.0	nil	0.083	0.081	0.43	73
cooked	92.8	nil	0.048	0.043	0.25	37
Xanthosoma brasiliense						
raw	89.1	2.045	0.062	0.244	0.99	96
cooked	91.2	4.884	0.044	0.198	0.46	38

188. MILLER, C.D., BAUER, A. & DENNING, H. "Taro as a source of thiamine, riboflavin and niacin". J. Amer. Diet. Ass., (1952) 28.

Retention of thiamine, riboflavin and niacin in home-cooked taro and taro leaves:

	Moisture mg%	Thiamine As assayed mg%	Thiamine dry weight mg%	Thiamine retention mg%	Riboflavin As assayed mg%	Riboflavin dry weight mg%	Riboflavin retention mg%	Niacin As assayed mg%	Niacin dry weight mg%	Niacin retention mg%
Taro corms, raw										
Piko Kea (Hawai.)	62.6	0.210	0.562		0.030	0.080		0.61	1.63	
Bun Long (Chin.)	58.4	0.174	0.419		0.026	0.063		0.66	1.58	
Dasheen (Jap.)	74.4	0.084	0.328		0.016	0.062		0.64	2.50	
Taro corms, cooked										
Piko Kea	74.3	0.111	0.432	77	0.030	(0.117)		0.47	1.83	(112)
Bun Long	59.6	0.100	0.248	59	0.025	0.062	98	0.58	1.44	91
Dasheen	74.9	0.073	0.291	89	0.015	0.060	97	0.60	2.39	96
Taro leaves, raw										
Kachea (Hawai.)	82.5	0.230	1.315		0.464	2.650		1.60	9.15	
Bun Long	80.5	0.168	0.862		0.440	2.256		1.54	6.87	
Taro leaves, cooked										
Kachea	83.6	0.173	1.055	80	0.450	2.742	103	1.56	9.52	104
Bun Long	81.4	0.131	0.704	82	0.419	2.230	99	1.33	8.07	97

189. MILLER, C.D., DENNING, H. & BAUER, A.

"Food values of native foods from Pacific Islands".

Hawaii Agric. Exper. Sta., Biennial Report, (1948-1950), 106-107.

A pandanus flour prepared at Kapingamarangi was found to contain 10.8% water, 2.9% protein, 1.2% ether extract, 15.6% crude fibre and 65.2% total carbohydrates by difference and 62.5 mcg. thiamine, 156 riboflavin, 2,250 mcg. niacin and 1,200 I.U. vitamin A per 100 gm. 100 g. furnished 284 calories.
Fresh breadfruit was found to contain 137 mcg. thiamine, 84 mcg. riboflavin, 103 mcg. niacin and 21 mg. calcium per 100 g. 70 g. will furnish 100 calories.
Preserved breadfruit from Kapingamarangi was found to contain 20.8% water, 6.4% protein, 2.7% ether extract 5.0% crude fibre, 48.1% total reducing sugars and 62.1% total carbohydrates (by difference), and 143 mcg. thiamine, 110 mcg. riboflavin and 7,320 mcg. niacin per 100 g. 100 g. furnished 298 calories.
Taro leaves were found to contain 144 mcg. thiamine, 280 mcg. riboflavin, 970 mcg. niacin and 5.6 mg. calcium per 100 g. cooked weight. 60 g. furnished 25 calories.
Taro corms were found to contain 149 mcg. thiamine, 25 mcg. riboflavin, 424 mcg. niacin, and 16.0 mg. calcium. 70 g. furnished 100 calories.

190. MILLER, C.D. & LOUIS, L.

"The availability of the iron in Hawaiian grown vegetables".

J. Nutrition, (1945) 30, 485-494.

The amount of iron and availability of it is reported for 15 vegetables and 2 sea-weeds.
The results are:

	iron mg/100g	% iron available
Green soy beans	2.98	96
Taro corms	1.52	93
Taro leaves	1.42	93
Fresh lima beans	1.83	74
Cow peas	1.12	65
Ipomoea aquatica	2.62	59
Amaranthus gangeticus	2.97	31
Xanthosoma brasiliensis	2.73	31

191. MILLER, C.D., LOUIS, L. & ROSS, W.

"Hawaiian grown vegetables - proximate composition; calcium, phosphorus, total iron, available iron, and oxalate content".

Hawaii Agr. Expt. Sta. Tech. Bull., (1947) 5, 45 pp.

Forty Hawaiian grown vegetables (32 species) analyzed. Data are presented for proximate composition of 66 vegetables species and for calcium, phosphorus, iron total ash and moisture contents of 88 vegetables. Composition of these vegetables was compared with published data. Hawaiian grown vegetables had slightly higher moisture content and consequently slightly lower percentage of solids. Their calcium and phosphorus contents were similar to, and the iron content lower than the average. Sufficient data presented to prove that there is no real deficiency of minerals in local vegetables.

(Fanning, R.J.: Pacific Islands Nutrition Bibliography, (1951) p. 36, University of Hawaii Press).

192. MILLER, C.D., LOUIS, L. & YAMAZAWA, K.

"Vitamin values of Hawaiian grown fruits and vegetables".

Hawaii Agric. Exp. Sta. Progress Notes, (1942) 36 (mimeographed).
(Fanning, R.J.: Pacific Islands Nutrition Bibliography).

193. MILLER, C.D., LOUIS, L. & YAMAZAWA, K.

"Foods used by Filipinos in Hawaii".

Hawaii Agr. Expt. Sta. Bull., (1946) No. 98, 80 pp.

Proximate composition, mineral analyses (including those for calcium, phosphorus and iron), and vitamin assays are reported for 22 food products much used by Filipinos in Hawaii. English, Filipino and scientific names are given. Other foods used by the Filipinos are listed. 15 figures illustrate the foods analysed. Recommendations for improving diet are given. A brief discussion of Filipinos' methods of food preparation is followed by recipes using food analysed.

(Fanning, R.J.: Pacific Islands Nutrition Bibliography, (1951) p. 35, University of Hawaii Press).

194. MILLER, C.D., LOUIS, L. & YAMAZAWA, K.

"Vitamin values of foods in Hawaii".

Hawaii Agr. Expt. Sta. Tech. Bull., (1947) No. 6, 56 pp.

This edition has been superseded by Technical Bulletin No. 30. (Reference No. 187)

195. MILLER, C.D. & ROBBINS, R.C. "Vitamin content of mountain apples, Eugenia malaccensis".

Hawaii Agr. Expt. Sta., Rept., (1932) 20

Mountain apples are a fair source of vitamin C, but are deficient in vitamins A and B.

(Chem. Abstr., (1934) 28, 2038[5]).

196. MILLER, C.D., ROBBINS, R.C. & HAIDA, K. "The nutritive value of the mountain apple, Eugenia malaccensis or Jambosa malaccensis".

Philippine J. Sci., (1934) 43, 211-228.

An analysis of Eugenia malaccensis is given and is compared with the apple.

(Fanning, R.J.: Pacific Islands Nutrition Bibliography, (1951), University of Hawaii Press).

197. MILLER, C.D. & ROBBINS, R.C. "Vitamin content of some Hawaiian fruits".

Hawaii Agr. Expt. Sta., Ann. Rept., (1934) 29-30.

The papaya was found to be an excellent source of vitamins A and C, a good source of riboflavin and a fair source of thiamine.

198. MILLER, C.D. & ROBBINS, R.C. "Nutritive properties of the papaya".

Hawaii Agr. Expt. Sta., Ann. Rept., (1935) 25.

One gram of papaya contained the equivalent of 20 γ of carotene. The amount of carotene was found to be smaller than was indicated by biological tests and it is suggested that the xanthophylls present possess vitamin A activity.

199. MILLER, C.D. & ROBBINS, R.C. "Nutritive properties of the papaya".

Hawaii Agr. Expt. Sta., Ann. Rept., (1936) 58.

The papaya is an excellent source of vitamins A & C, a fair source of riboflavin but a poor source of thiamine. The vitamin C content increases with maturity to 70 mg. per 100 g. in the ripe edible fruit.

200. MILLER, C.D. & ROBBINS, R.C. "The nutritive value of papaya".

Biochem. J., (1937) 31, 1-11.

The composition of papaya is given as 85.6% water, 0.5% N x 6.25 0.3% ether extract, 0.8% crude fibre

200. (Cont'd) calcium, 13 mg.% phosphorus, 0.25 mg.% iron, 132 mg.% iron, 132 mg.% chloride. The vitamin content, rat growth method, is stated to be: A. 2500 I.U., thiamine 8 I.U., and riboflavin 32 B.S. units. The ascorbic acid content of ripe fruit is given as 70 mg.%.

201. de MOURA CAMPOS, F.A. "Vitamin B complex in the root of the manioc".

Ann. fac. med. univ. Saô Paulo, (1935) 11, 27-31.

Cassava meal is a fairly good source of the B complex.

Chem. Abstr., (1936) 30, 6792[5]).

202. de MOURA CAMPOS, F.A. "Vitamin B complex of cassava roots".

Ann. fac. med. univ. Saô Paulo, (1937) 13, 33-53.

Cassava flour contains a considerable amount of B_1 but not B_2. Vitamin B_2 is present in the fresh root but is lost during processing.

(Chem. Abstr.,(1938) 32, 6697[4]).

203. de MOURA CAMPOS, F.A. "O valor nutrivo do cara. (The nutritive value of cara)".

O hospital (Rio de Janeiro), (1943) 24, 877-892.

Cara (Dioscorea sp.) is claimed to be a very good source of vitamin B.

204. de MOURA CAMPOS, F.A. "Vitamin value of the banana".

Brazil med., (1946) 61, 197-199.

Values for vitamins A and C are quoted from the literature. Tests for B vitamin were carried out using rats.

(Chem. Abstr., (1947) 41, 6950i).

205. de MOURA CAMPOS, F.A., CAVALCANTI, T.A. de A. & de PAULA SANTOS, O. "Contribuicao ao estudo do valor nutriyo de alguns alimentos. III. Proteina, calcio, Ferro e complexo vitaminico B. (Contribution to the study of the nutritive value of some foods. III. Protein, calcium, iron and vitamin B complex)".

O hospital (Rio de Janeiro), (1938) 14, 227-240.

Cara (Dioscorea brasiliensis and Dioscorea triloba) no difference is made between the species in the analysis, contained 1.35% protein 0.01% calcium and 0.00057% iron.

Ipomoea batatas contains 0.0.099% iron. Thiamine is considered to be present.

206. MOWRY, H. & TROY, L.R.

"Miscellaneous tropical and subtropical fruits. The papaya".

Florida Agric. Expt. Sta. Bull., (1931) 223, 88 pp.

Culture, fertilization of the papaya and other subtropical fruits are given together with some data on composition. The ripe papaya contains no papain, though this powerful digestive enzyme is present in the latex of the vegetable parts and in the immature fruit.

(Chem. Abstr., (1934) 28, 1379[6]).

207. MULEY, I., DHOPESHWARKAR, G.A. & NAGAR, N.G.

"Losses of nutrients during the cooking of vegetables".

Ind. J. Med. Res., (1953) 40, 447-455.

The leaves of Colocasia antiquorum, Amaranthus sp. and Portulaca oleracea were examined and shown to contain:

	Water %	Calcium mg%	Iron mg%	Phosphorus mg%	Oxalic acid mg%	Carotene mg%
Colocasia antiquorum	85.9	335	34.2	65	315	7.4
Amaranthus paniculatus	79.0	563	59.6	80	148	3.0
Amaranthus spinosus	72.6	271	-	-	266	-
Portulaca oleracea	91.8	301	24.9	51	27.0	4.0

Various cooking techniques with Colocasia antiquorum leaves showed losses of up to 30% for calcium, up to 43% for iron, up to 42% for phosphorus and up to 28% for carotene.

208. MUNSELL, H.E.

"Ascorbic acid content of fruits of Puerto Rico with data on miscellaneous products".

Food Research, (1945), 10, 42-51.

Foods examined included papaya, taro, Terminalia nuts, Anona sp., mangos and breadfruit.
It was found that the ascorbic acid content of green Carica papaya L. fruit was 29.44 mg.%, the ripe fruit 86.71 mg.%, of Xanthosoma sagittae-folium L. Schott. tuber was 10.02 mg.%, of immature nuts of Terminalia catappa L. was 3.6 mg.%, of Anona reticulata L. fruit was 34.53 mg.%, of Anona muricata L. fruit was 25.6 mg.%, of mangos (Mangifera indica L.) ranged from 9.86-118.49 mg.%, of the fruit of Artocarpus communis was 35.32 mg.%, of Dioscorea alata was 9.51 mg.%, and of two varieties of Ipomoea batatas was 6.82 and 13.32 mg.%.

209. MUNSELL, H.E. "Riboflavin content of some common foods".
Food Research, (1942) 7, 85-95.
Riboflavin was determined using rat growth methods. The value obtained for sweet potato was 0.050 mg. per 100 g.

210. MUNSELL, H.E., CASTILLO, R., ZWITA, C. & PORTILLA, J.M. "Production, uses and composition of foods of plant origin from Ecuador".
Food Research, (1953) 18, 319-342.
Included in the analyses are those shown on page 62.

211. MUNSELL, H.E., WILLIAMS, L.O., GUILD, L.P., KELLEY, L.T. & HARRIS, R.S. "Composition of food plants of Central America. VII. Honduras".
Food Research, (1950) 15, 421-438.
Included in the analyses are those shown on page 62.

212. MUNSELL, H.E., WILLIAMS, L.O., GUILD, L.P., KELLEY, L.T. McNALLY, A.M. & HARRIS, R.S. "Composition of food plants of Central America. VIII. Guatemala".
Food Research, (1950) 15, 439-453.
Included in the analyses are those shown on page 62.

213. MUNSELL, H.E., WILLIAMS, L.O., GUILD, L.P., TROESCHER, C.B. & HARRIS, R.S. "Composition of food plants of Central America. V. Nicaragua".
Food Research, (1950) 15, 355-365.
Results (on page 63) are included for sweet potato, taro, banana and plantains.

214. MUNSELL, H.E., WILLIAMS, L.O., GUILD, L.P., KELLEY, L.T., McNALLY, A.M. & HARRIS, R.S. "Composition of food plants of Central America. VI. Costa Rica".
Food Research, (1950) 15, 379-404.
Included in the analyses are those shown on page 63.

215. MUNSELL, H.E., WILLIAMS, L.O., GUILD, L.P., TROESCHER, C.B., MARTINCALE, C. & HARRIS, R.S. "Composition of food plants of Central America. I. Honduras".
Food Research, (1949) 14, 144-164.
Included in the analyses are those shown on page 64.

Ref. 210

Ipomoea batatas
Tetragonia expansa
Anona muricata
Anona charimola
Carica papaya
Musa paradisiaca var. sapientum
Passiflora ligularis

Ref. 211

Ipomoea batatas (growing points
Musa paradisiaca var. sapientum

Musa paradisiaca (plantain)

Ref. 212

Amaranthus hybridus L.
Anona muricata
Anona squamosa
Carica papaya L.
Carica papaya L.
Ipomoea batatas
Musa paradisiac
var. sapientum
Portulaca oleracea L.
Mangifera indica

Ref. 216	Water %	Ether extract %	Crude fibre %	Nitrogen %	Ash %
Amaranthus hybridus L.					
sample 1	86.8	1.72	2.8	0.30	2.5
sample 2	85.8	0.46	1.5	0.69	2.7
Ipomoea batatas	66.2-71.8	0.12-0.55	0.9-1.2	0.155-0.222	0.8
					1.0
Portulaca oleracea L.	92.4	0.40	0.8	0.295	1.3
Tetragonia expansa	91.5-91.9	0.24-0.25	0.8	0.425-0.484	1.5
					1.0

Ref. 217

Anona reticulata L.	75.6	0.10	0.9	0.192	0.5
Carica papaya	86.8	0.53	0.7	0.074	0.4
Carica papaya	88.4	0.34	0.7	0.076	0.4
Mangifera indica L.	82.1	0.04	0.7	0.059	0.3
" "	80.0	0.46	0.7	0.112	0.5
" "	78.9	0.03	0.7	0.113	0.5
" "	81.5	0.72	0.6	0.064	0.3
" "	86.7	0.22	0.6	0.073	0.3
" "	83.1	0.03	0.7	0.048	0.3
Musa paradisiaca var. sapientum	64.2-73.8	0.08-1.01	0.3-0.8	0.242-0.299	0.7 0.9
Musa paradisiaca (plantain)	61.7-76.8	0.03-0.37	0.3-1.0	0.157-0.186	0.8 0.9
Passiflora ligularis L.	76.5	1.50	3.2	0.365	1.0
" "	69.9	3.17	5.6	0.474	1.3

	Calcium mg%	Phosphorus mg%	Iron mg%	Carotene mg%	Thiamine mg%	Riboflavin mg%	Niacin mg%	Ascorbic acid mg%
55	252.3	71.7	43.38	?[illegible].218	0.075	0.267	1.252	58.4
75	315.0	82.0	12.42	5.841	0.094	0.288	1.282	92.0
4- 02	17.0-19.7	18.2-62.8	0.93-1.18	0.038-0.128	0.082-0.125	0.044-0.045	0.784-0.812	49.0-64.0
68	74.1	30.9	1.79	1.779	0.028	0.131	0.523	26.0
51- 49	47.4-66.2	40.7-49.3	3.04-5.16	0.057-2.140	0.[illegible]09-0.[illegible]40	[illegible].175	0.53-0.572	50.3-50.1
	17.6	14.7	1.14	0.000	0.094	0.126	0.640	15.0
	21.[illegible]	7.0	0.49	0.006	0.031	0.032	0.227	51.5
7	12.9	11.2	0.65	0.045	0.028	0.[illegible]26	0.[illegible]3	36.4
2	6.1	[illegible].9	0.40	1.349	0.028	.039	[illegible].316	41.8
1	10.5	16.2	0.43	0.224	0.042	0.062	0.774	77.0
7	7.5	13.9	0.37	0.515	0.052	0.068	0.707	63.6
7	12.4	7.7	0.20	0.098	0.027	0.039	0.347	57.5
1	7.0	6.6	0.55	0.135	0.020	0.025	.22[illegible]	114.[illegible]
5	10.7	5.5	0.21	0.798	0.024	[illegible].032	0.242	64.4
[illegible]- [illegible]	3.2-6.5	18.1-50.4	0.41-0.53	0.010-0.084	0.026-0.[illegible]54	[illegible].024-0.[illegible]07	0.[illegible]76-1.05[illegible]	10.1-36.4
[illegible]- 7	1.9-[illegible].7	1[illegible].0-79.4	0.45-0.78	0.019-0.681	0.026-0.[illegible]3	0.030-[illegible].040	0.559-0.723	7.[illegible]-1[illegible].9
9	19.7	44.0	0.70	0.001	[illegible].002	0.117	1.490	20.[illegible]
5	7.6	78.0	1.16	0.000	0.000	0.103	1.813	13.4

Ref. 218

Anona muricata L.	
Anona reticulata L.	
Anona diversifolia Safford	
Carica papaya L.	
" " green	
Dioscorea alata	7
Eugenia malaccensis	9
Ipomoea batatas	7
Mangifera indica L. green & skin	
Mangifera indica L. " "	
Musa paradisiaca var. sapientum	6
Musa paradisiaca (plantain)	6
Passiflora quadrangularis L. seeds & aril	
Passiflora quadrangularis L. flesh only	
Passiflora ligularis Juss	
Tetragonia expansa	9

216. MUNSELL, H.E., WILLIAMS, L.O., GUILD, L.P., TROESCHER, C.B. NIGHTINGALE, G. & HARRIS, R.S.

"Composition of food plants of Central America. II. Guatemala".

Food Research, (1950) 15, 16-33.

Included among the results (see page 65) are those for amaranthus leaves, portulaca leaves, New Zealand spinach and sweet potato tubers.

217. MUNSELL, H.E., WILLIAMS, L.O., GUILD, L.P., TROESCHER, C.B., NIGHTINGALE, G. & HARRIS, R.S.

"Composition of food plants of Central America. III. Guatemala".

Food Research, (1950) 15, 34-52

The compositions (see page 65) include mango, passion-fruit, papaya, bullock's heart, bananas and plantains.

218. MUNSELL, H.E., WILLIAMS, L.O., GUILD, L.P., TROESCHER, C.B., NIGHTINGALE, G. KELLY, L.T. & HARRIS, R.S.

"Composition of food plants of Central America. IV. El Salvador".

Food Research, (1950) 15, 263-296.

Included in the analyses are those shown on page 66.

219. MUTO, T.

"Microcomponents in living bodies by paper partition chromatography. II. Distribution of free amino-acids in roots crops".

J. Agr. Chem. Soc. Japan, (1950) 24, 325-330.

Free amino-acids in eleven root crops were detected by paper chromatography.

(Chem. Abstr., (1953) 47, 1219e).

220. NAKAGAWA, I.

"Ascorbic acid in sweet potatoes".

Igaku to Seibutsugaku (Med. & Biol.), (1947) 10, 154-155.

The thiamine content of six varieties of sweet potatoes, steam-boiled was 61-154 γ/100g. Reduced and total ascorbic acid content was 9-30 and 23-48 mg.% respectively in the steam-boiled vegetable, whilst two varieties of dried sweet potato contained 7-9 and 15-28 mg.% respectively.

(Chem. Abstr., (1953) 47, 2395e).

221. NELSON, E.M. & BREESE-JONES, D.

"Vitamins in sugar-cane juice and in some cane juice products".

J. Agr. Research, (1930) 41, 749-759.

Sugar cane juice is a poor source of vitamin A.

(Chem. Abstr., (1931) 25, 2763[1])

222. NISHI, H.

"The proteins of sweet potato".

J. Agr. Chem. Soc., (Japan) (1949) 23, 52-55.

Sweet potato had 69.34% moisture, 1.00% crude protein and 0.94% true protein. The protein consisted of 6[illegible]% globulin. The globulin contained 0.37% ash, 15.07% nitrogen, 2.34% acid-insoluble humin, 8.38% amide, 1.01% histidine, 4.28% arginine, 3.98% lysine, 1.[illegible]9% tryptophan, 4.44% tyrosine and 4.13% threonine.

(Chem. Abstr., (1950) 44, 3094e).

223. NISHIDA, K.

"Biochemical studies on 'sotetsu', the Japanese sago plant (Cycas revoluta Thumb.). I. Changes of the general composition of 'sotetsu' seed during ripening".

Bull. Agr. Chem. Soc. Japan, (1934) 10, 78-80.
J. Agr. Chem. Soc. Japan, (1934) 10, 374-380.

The composition of Cycas revoluta seeds at various stages of maturity is given.

(Chem. Abstr., (1934) 28, 5097^{3}, (1935) 29, 8052^{1}).

224. NISHIDA, K.L. & YAMADA, A.

"Biochemical studies on 'sotetsu', the Japanese sago plant. II. The chemical constituents, especially the sex differences of 'sotetsu' stems.

Bull. Agr. Chem. Soc. Japan (1934) 10, 193-196.

Comparative figures are given for different parts of the plants and for male and female plants.

(Chem. Abstr., (1936) 30, 135^{9}).

225. NOGUEIRO, C.C. & de MOURA CAMPOS, F.A.

"Riboflavina e piridoxina nos tuberculos da Dioscorea brasiliensis-Willd. (Riboflavin and pyridoxin in the tuber of Dioscorea brasiliensis-Willd).

O Hospital, (1941) 20, 855-863.

Using rat growth studies, it was found that Dioscorea brasiliensis was a good source of riboflavin and pyridoxin.

226. NOVIS, J. & COUTINHO, E.M.

"Investigacao sombre o valor biologico proteico da sements de "Artocarpus intergrifolia" (jaca). (Investigations on the biological value of proteins from Artocarpus intergrifolia (jack seeds)".

Arquiv. Univ. Bahia, Fac. Med., (1952) 8, 182-187.

226. (Cont'd) It is stated that fresh jack seeds contain 53.98% water, 31.00% carbohydrates, 8.60% protein and 0.60% fat, whilst the flour prepared from jack seeds contains 4.8% water, 63.0% carbohydrates, 12.6% protein and 1.4% fat. It was found that the digestibility of jack seeds protein was 71.5% and the biological value was 28.1% using the rat growth and feeding jack seeds at a protein level of 9.4%.

227. ORR, M.J "The sugar and ascorbic acid content of papayas in relation to fruit quality".

Food Research, (1953) 18, 532-537.

311 samples of solo papaya analysed over an eleven month period showed significant variations in their pH, total sugar, ascorbic acid and moisture contents, and their flavour, sweetness and colour. Significant correlation coefficients were found between total sugar and flavour, sweetness, ascorbic acid and pH respectively and between moisture and ascorbic acid.

228. ORSINI, D. "Fuentes naturales de vitamina C. Contenido de algunas frutas brasilenos. (National sources of vitamin C. The content of some Brazilian fruits)".

Ciencia e invest, (Buenos Aires), (1945) 1, 216-218.

The values for various fruits are given including Eugenia uvalha 115 mg.%, papaya 54 mg.%, mangos 19-38 mg.%, and bananas 11 mg.%.

229. OYENUGA, V.A. "The composition and nutritive value of certain feeding-stuffs in Nigeria. I. Roots, tubers and green leaves".

Empire Expt. Agric., (1955) 23, 81-95.

Analyses were carried out on materials that could be used as cattle foods. Included in the results were:

	Water %	Crude protein %	Ether extract %	Crude fibre %	Ash (total) %
Xanthosoma sagittifolium					
peeled tubers	78.1	2.87	0.59	1.24	3.84
leaves	90.6	20.62	11.74	12.05	12.18
Colocasia esculenta					
peeled tubers	72.2	7.57	0.37	1.63	4.74
leaves	91.6	21.95	10.66	12.08	12.42

229. (Cont'd)

	Water %	Crude protein %	Ether extract %	Crude fibre %	Ash (total) %
Ipomoea batatas					
peeled tubers	71.2	5.24	0.46	0.14	2.67
leaves	87.5	24.65	3.58	9.10	11.47
Dioscorea esculenta					
peeled tubers	81.1	7.73	0.05	0.95	2.65
Dioscorea alata					
peeled tubers	73.8	7.26	1.58	2.29	5.16

230 PADILLA, S.P. & SOLIVEN, F.A. "Chemical analysis for possible sources of oils of forty five species of oil-bearing seeds".

Philippine Agr., (1933) 22, 408-415.

The composition of the following were included in the analyses:

	Water %	Ash %	Protein %	Fat %	Carbo-hydrate %
Aleurites moluccana	2.5	3.3	25.6	65.5	5.1
Calophyllum inophyllum	27.7	1.1	6.4	60.7	4.1
Canarium ovatum	4.2	3.0	16.5	72.0	4.3
Cocos nucifera	48.5	1.0	5.4	31.6	13.6
Entada phascoloides	9.1	2.3	23.5	2.1	63.0
Leucaena glauca	13.7	5.4	57.3	13.2	10.4
Moringa oleifera	6.5	3.2	46.6	32.6	11.2
Pachyrrhizus erosus	8.1	4.3	38.5	25.8	22.3
Psophocarpus tetragonolobus	8.5	5.3	41.9	13.1	31.2
Sesbania grandiflora	10.4	9.5	68.2	7.1	8.8

(Chem. Abstr., (1934) 28, 2207[2]).

231. PANDITTESEKERA, D.G. & ELIYEWELA, Y. "Some indigenous feeding stuffs of Ceylon".

Trop. Agriculturist. (Ceylon), (1947) 103, 176-178.

Some values are given for jackfruit, but the degree of ripeness and portion of the fruit analysed is not clear. Four breadfruit samples were analysed with the following results:

231. (Cont'd)

	Water	Protein	Carbo-hydrate	Ether extract	Fibre	Mineral matter
	%	%	%	%	%	%
Ripe, mature, edible	73.7	1.94	21.95	0.51	1.11	0.79
Ripe, mature boiled & dried whole fruit	7.68	4.22	71.87	0.89	12.45	2.89
Ripe, mature, boiled & dried edible portion	8.46	4.20	78.27	0.20	6.73	2.13
Ripe immature (?)	61.00	2.20	33.13	0.15	1.89	1.63

232. PARAHYM, O. "Nutritive value of the banana".

Rev. ailimentar, (Rio de Janeiro), (1945) 9, 37-39.

Musa paradisiaca contains 66.2% water, 0.2% fat, 2.6% nitrogen compounds, 29.0% carbohydrate, 0.9% fibre, 1.1% ash, and 410 I.U. vitamin A, 50 γ thiamin, 70 γ riboflavin, and 10 mg. ascorbic acid per 100 grams. A literature summary is included.

(Chem. Abstr., (1946) 40, 6183^{9}).

233. de PAULA SANTOS, O. "The nutritive value of adlay (Coix lacryma)".

Anais fac. med. univ. Sao Paulo, (1950-1951) 25, 323-346.

The chemical composition of finely and coarsely ground flour of Job's tears is 14.1, 12.8% protein, 46, 32 mg.% calcium, 236, 137 mg.% phosphorus, and 3.4, 5.8 mg % iron. The biological value of the protein determined from feeding experiments is low.

(Chem. Abstr., (1953) 47, 6059e)

234. PAYNE, J.H., LEY, G.J. & AKAU, G. "Processing and chemical investigation of taro".

Hawaii. Agric. Expt. Sta. Bu.., (1941) 86, 3-42.

A sample of 50 lb. each of four varieties of Hawaiian taros were analysed. The following results were obtained on the cooked, air-dried samples:

234. (Cont'd)

Analysis of air-dried cooked taro

	Wetland varieties		Upland varieties	
	Piialii	Piko Uliuli	Lehua Palaii	Mana Opelu
	%	%	%	%
Moisture (vac.70°-75° C. for 18 hrs)	6.60	6.37	6.40	4.05
Ash	1.76	1.43	1.83	2.38
Crude fibre	1.45	1.31	1.17	1.68
Dextrins	.47	.48	.55	.95
Ether extract	.54	.52	.47	.68
Pentosans	2.48	2.37	2.06	3.40
Protein (nitrogen x 6.25)	1.75	1.85	1.91	2.36
Reducing sugar	.49	.48	.66	.77
Starch	71.6	73.7	69.6	69.12
Sucrose	.08	.10	.10	.09

Ash analysis of air-dried cooked taro

	Wetland varieties		Upland varieties	
	Piialii	Piko Uliuli	Lehua Palaii	Mana Opelu
	%	%	%	%
Ash	1.91	1.54	1.96	2.48
Calcium	.059	.089	.106	.169
Chlorine	.081	.069	.084	.109
Copper	.0001	.0003	.0004	.0001
Iron	.0050	.0043	.0042	.0050
Magnesium	.054	.082	.086	.114
Manganese	.0012	.0010	.0001	.0001
Phosphorus	.119	.150	.113	.274
Potassium	.500	.408	.632	.879
Sodium	.0076	.0066	.0020	.0042
Sulphur	.0198	.0147	.0296	.0316
Zinc	.0001	.0001	.0005	.0007
Acid-base bal.cc. N.HCl per 100 g.	22.2	19.1	22.9	29.7

235. PAYNE, W.J.H., NAIDU, R.K., SILLS, V.E. & HOLMES, S.V. "Fish farming".

Agric. J. Fiji, (1954) 25, 71-76.

An analysis of Ipomoea reptans is given :

	Water %	N x 6.25 %*	Crude fibre %*	Ash %*	Ether extract %*
Leaves & shoots	90.8	34.3	10.2	12.9	3.9
Whole plant	93.1	19.6	20.4	15.3	3.4

* dry weight basis

236. PEARSON, P.B. & LUECKE, R.W.

"The B vitamin content of raw and cooked sweet potatoes".

Food Research, (1945) 10, 325-329.

The B vitamin content of raw and cooked sweet potatoes and of sprouts, and sprouted sweet potato were examined. Average values were found to be:

	Thiamin µg%	Riboflavin µg%	Nicotinic acid µg%	Pantothenic acid g%
Sweet potato				
raw	139	46	556	1095
sprouted	67	49	420	1090
sprouts	80	55	530	1090
% retention				
baked	75.5	88.6	85.1	76.8
boiled	92.3	103.2	100.6	99.9

237. PETERS, F.E. & WILLS, P.A.

"Dried breadfruit".

Nature (in press).

An analysis of dried breadfruit from the Solomon Islands and fresh breadfruit from Western Samoa is given:

	Dried %	Fresh %
Water	8.0	80.0
Ether extract	2.1	0.5
Crude fibre	4.7	1.2
Total nitrogen	0.68	0.12
Ash	4.2	0.8
Starch	72.0	12.0
Calcium	0.44	0.03
Phosphorus	0.13	0.03

238. POORE, H.D.

"Passionfruit products".

Fruit Prod. J., (1935) 14, 264-268, 285.

A general article on the fruit, its products and cultivation. An analysis of the expressed juice is given as : acid (as citric) 2.016-2.6%, calcium pectate 0.05-0.06%, total solids 18.58-19.53%, ash 0.49-0.52%, total sugars 11.74-11.32%, glucose 9.35-7.69%, sucrose 2.39-3.63%, N x 6.25 1.46-1.38%. The seeds contain 5.58-7.92% water and 18.17-23.46% oil.

239. POPE, W.T. "Papaya culture in Hawaii".

Hawaii. Agric. Exp. Sta. Bull., (1930) 61, 40 pp.

A survey of all aspects of papaya growing, harvesting and packing in Hawaii.
An analysis of papaya, carried out in 1922, is given as 11.05-16.27% total solids, 0.687-0.887% ash, 0.454-0.458% N x 6.25, 0.30-0.83% sucrose, 8.43-13.38% reducing sugars, 0.00-0.14% fat and 0.818-1.255% fibre.

240. POPE, W.T. The edible passionfruit of Hawaii".

Hawaii. Agric. Expt. Sta. Bull., (1935) 74, 1-22.

Passiflora edulis consists of 51% rind 20.2% seeds and 28.8% juice.
The seeds (moisture free) consist of 12.7% N x 6.25, 8.32% ether extract, 18.30% N free extract, 59.2% fibre, 1.92% ash, 0.03% calcium, and 0.66% phosphorus.
The juice contains 79.8% water, 0.6% N x 6.25, 0 fat, 0 fibre, 0.48% ash, 19.1% carbohydrate (difference). Acidity (as citric acid) 2.3%, calcium 0.005%, phosphorus 0.018%, and iron 0.00054%.
The rind (moisture free) consists of 9.53% N x 6.25, 0.6% ether extract, 52.84% nitrogen free extract, 30.1% crude fibre, 6.933% ash, 0.46% calcium, and 0.18% phosphorus.

241. POPE, W.T. & POTGIETER, M. "Taro (Colocasia esculenta) as a food".

J. Amer. Diet. Ass., (1940) 16, 536-540.

More intensive use of taro is being urged in Hawaii because of its capacity for correcting specific local dietary deficiencies. Increased production and use of taro would tend to decrease amount of imported refined foods used and increase calcium and vitamin B contents of deficient diets. Greater taro production would also aid in making the islands nutritionally self-sustaining.

242. POTGIETER, . "Taro as a dietary source of calcium".

Hawaii. Agric. Expt. Sta., Ann. Rept., (1930) 86-87.

It was concluded, after balance studies on two women that the calcium of taro is as well utilised as that of other vegetables. In experiments with young rats where taro provided 97% of the calcium and 58% of the phosphorus. the utilization of calcium was found to be extremely good.

243. POTGIETER, M. "The utilisation of calcium and phosphorus of taro by young rats".

J. Amer. Diet. Assoc., (1940) 16, 670-673.

The calcium and phosphorus of taro were 90% as readily utilised as soluble calcium and phosphorus salts.

244. POTGIETER, M. "The utilisation of calcium and phosphorus of taro by young women".

J. Amer. Diet. Assoc., (1940) 16, 898-904.

In balance studies with two young women, taro and white rice were compared as sources of available calcium and phosphorus. The taro furnished about 80% of the calcium and 40% of the phosphorus in one diet and it was concluded that these minerals were well utilised by both women.

245. POTGIETER, M. & MILLER, C.D. "Vitamins and minerals of taro".

Hawaii Agric. Expt. Sta., Ann. Rept., (1936), 58-59.

Japanese taro, Colocasia esculenta, has somewhat less vitamin C than white potatoes, a low vitamin A content but is a good source of vitamins B and G. The calcium content is higher than that of rice. Preliminary results indicate the calcium of taro is well utilised.

246. POTGIETER, M. & TAKASE, T. "Nutritive value of taro".

Hawaii Agric. Expt. Sta., Ann. Rept., (1937), 62.

The vitamin B_1 content of taro flour made from Haehae variety was 0.9 international units per g. or 25 units per 100 cal. Probably most of the vitamin B_1 is retained after the taro flour has been manufactured, into poi. The Japanese taro, Colocasia esculenta, is a poor source of vitamin C and contains 0.03-0.05 mg. per g. of ascorbic acid.

247. QUINONES, V.L., GUERRANT, N.B. & DUTCHER, R.A. "Vitamin content of some tropical fruits, their juices and nectars".

Food Research, (1944) 9, 415-417.

The carotene, thiamin, riboflavin and ascorbic acid content of papaya, guava, mango, oranges and pineapple were determined.

247. (Cont'd)

The contents were found to be:

	Carotene mg%	Thiamin mg%	Riboflavin mg%	Ascorbic acid mg%
Papaya ripe	0.790-0.990	0.042-0.045	0.038-0.050	29-63
Papaya green	0.713	0.039	0.052	40
Mango ripe	0.505-0.527	0.057-0.063	0.037-0.073	15-17
Pineapple juice	0.023-0.026	0.051	0.017-0.023	21

248. RANGANATHAN, S. "The effect of storage on the vitamin C potency of foodstuffs".

Indian J. Med. Research, (1935) 23, 755-762.

Coriander and tender amaranth lose vitamin C rapidly during storage. Mangoes retain their vitamin C if stored green, but lose it if stored after they ripen.

(Chem. Abstr., (1936) 30, 31014).

249. RAO, P.S. & BERI, R.... "Starch from the tubers of Dioscorea bulbifera".

Science and Culture, (1952) 18, 41-42.

The tubers of Dioscorea bulbifera contain nearly 83% starch on a dry weight basis.

250. RAO, P.S. & BERI, R.... "Dioscorea starches".

Science and Culture, (1955) 20, 397-399.

A comparison is made of the starches from Dioscorea alata, Dioscorea sativa and Dioscorea anguina.

251. RAYMOND. W.D. & JOJO, W.L. "Nutritive value of some Tanganyika foods. I. Banana".

E. African Agr. J., (1940) 5, 105-108.

Representative figures for the composition of bananas are given from the analyses of 21 varieties.

(Chem. Abstr., (1941) 35, 6007[8]).

252 RAYMOND, W.D., JOJO, W.L. & NICODEMUS, Z. "Nutritive value of some Tanganyika foods. II. Cassava"

E. African Agr. J., (1941) 6, 154-159.

Fresh cassava roots and leaves (without stalks) contain (%) 62, 74 water, 30, 5 carbohydrate, 0.7, 7.5 protein, -, 0.7 fat, 0.04, 0.1 calcium, 0.1, 0.1 phosphorus, 30, 3.0 mg.% ascorbic acid.

(Chem. Abstr., (1942) 36, 2947[7]).

253. REGNAUDIN, A. "The sago palm: sago starch".

Bull. assoc. chim. sucr. dist., (1934) 51, 267-269.

Crude sago starch contains 16-18% water. The dry starch contains 3.5% fibre, 0.54% ash, 0.16% protein, has a pH 6.8.

(Chem. Abstr., (1934) 28, 6336^2).

254. REMINGTON, R.E. & SHIVER, H.E. "Iron, copper and manganese content of some common vegetable foods".

J. Assoc. Official Agr. Chem., (1930) 13, 129-132.

Sweet potatoes contained 29.9% dry matter, 64 ppm. iron, 9.3 ppm. manganese, and 62 ppm. copper.

(Chem. Abstr., (1930) 24, 2210^2).

255. RIBEIRO, O. "Vitamin B_2 in some vegetables".

Anais assoc. quim. Brazil, (1947) 6, 119-122.

Amaranthus contains 0.175 mg./100 g. riboflavin and cassava 0.037 mg./100 g.

(Chem. Abstr., (1950) 44, 2139e).

256. RIBEIRO, O. "Determination of carotene in the presence of lycopene".

Anais assoc. quim. Brazil, (1947) 6, 215-218.

The values of the total of carotene, lycopene and unidentified pigments, on the one hand, and of carotene alone, on the other, are given in one table for tomato and red pumpkin samples obtained with the optical colorimeter, and a second table furnishes the same data for red pumpkin, tomato, pawpaw, red pimento, red guava and persimmon with the photoelectric colorimeter.

(Chem. Abstr., (1948) 42, 7820c).

257. RIBEIRO, R.F., BONOLDI, F. & RIBEIRO, O.F. "Vitamin C distribution in different parts of the lime (Citrus limetta Risso) and the dwarf banana (Musa chinensis)".

Rev. faculdate med. vet., Univ. Sao Paulo (Brazil), (1942) 2, 23-27.

The dwarf banana contains 10.5 mg.% ascorbic acid.

(Chem. Abstr., (1944) 38, 4711^9).

258. ROBINSON, J.B.D. & PARRY, J.M. "Ascorbic acid content of some local Barbados foods".

Nature, Lond., (1949) 164, 531-532.

Random samplings of Colocasia antiquorum and C. esculenta gave: 3.7 and 2.8 mg. per 100 g. respectively of ascorbic acid, whilst a sample of Anona muricata (soursop) assayed 12.4 mg. per 100 g. ascorbic acid and 3 samples of Dioscorea alata gave 6.1-7.0 mg./ 100 g.

259. de la ROCHA, G. & GUILLANTE, M.G. "Some important aspects of the mango (fruit) and its varieties cultivated at la Molina".

Agronomia (Peru), (1953) 18, 79-84.

The percentage composition of the mango varieties Corazal, Haden, California, Saygon, Cambodaiana and Carne was respectively: water 82.62, 84.04, 72.91, 86.04, 83.65, 81.05; ash 0.34, 0.39, 0.35, 0.49, 0.38, 0.55; protein 1.57, 2.10, 2.67, 1.75, 1.75, 5.42; fibre -, -, 0.30, -, 0.02, -; sugar 15.47, 13.47, 14.77, 11.72, 14.20, 12.48; total solids 12.36, 14.37, 17.36, 13.36, 13.44; acidity (as citric acid) 0.336, 0.336, 0.924, 0.07, 0.691.

(Chem. Abstr., (1954) 48, 2180).

260. ROCHA de ALMEIDA, J. "Composition of cane and cane juice with reference to the vitamin B complex".

Rev. alimentar (Rio de Janeiro), (1945) 9, 5-7.

A brief discussion of the vitamins.

(Chem. Abstr., (1946) 40, 6855^5).

261. ROSS, W. & HARTZLER, E. "Effect of guava juice and papaya on the acidity of the urine".

J. Amer. diet. Ass., (1946) 22, 310-311.

The organic acids of papayas and guavas appear to be completely oxidized in metabolism. They also produce a base-forming ash when ingested and metabolized by the human body.

(Chem. Abstr., (1947) 41, 5588i).

262. de RUIZ. E., DURAN, [illegible]., ROSENKRANZ, J. & KAUFMANN, E. "Vitamin C content of Cuban fruits".

Inform. med., (Cuba), (1946) 10, 160-165.

The ascorbic acid content of 38 Cuban fruits is presented.

(Chem. Abstr., (1947) 41, 4247c).

263. RYDER, A.E.

"The oxalic acid content of vegetables used as greens".

J. Home Econ., (1930) 22, 309-314.

The oxalic acid content of New Zealand spinach is given as 1.2%.

(Chem. Abstr., (1930) 24, 25115).

264. RYO YAMAMOTO, TAKESI HARA & SIZUKO NISIZAWA

"Vitamin C contents in leaves".

J. Agric. Chem. Soc. Japan, (1940) 16, 384-385.

Carica papaya leaves were found to contain 286 mg.% ascorbic acid.

(Chem. Abstr., (1941) 35, 18328).

265. SADANA, J.C. & BASHIR AHMAD

"Carotenoid pigments of common Indian fruits".

J. Sci. Industr. Res., (India), (1949) 8B, 35-39.

A sampling of papayas (Carica papaya) at various stages of ripeness from Lucknow had an estimated vitamin A potency of 1.6 I.U./g. in an unripe sample, to 17.0 I.U./g in a fully ripe sample.
Five pigments were isolated from Mangifera indica fruits (9 varieties were examined) and the vitamin A potency was estimated to range from 7.2 I.U./g. to 179.5 I.U./g. Bananas were shown to have a vitamin A potency of 1.0-4.5 I.U./g.

266. dos SANTOS CARVALHO, J.

"Composiao de alguns alimentos exoticos e seus nomes vulgares. (Composition of some exotic foods and their common names)".

An. Inst. Med. trop., Lisboa, (1953) 10, 1555-1561.

A list of thirty food plants is given with their botanical names, common names and names in Portugese, English and French. Included among the values given for these foods are:

(See page 79a).

267. SATO, M., HIRANO, T. & MIZUNO, N.

"Nutrition-Chemical investigation on vegetables produced in Taiwan".

I. Inorganic constituents of ashes and their basicity.
II. Oxalic acid content.

J. Soc. Trop. Agr., Taihoku Imp. Univ., (1942) 14, 212-220; (1943) 15, 123-130.

266. (Con-

267. (Cont'd)

The ashes of eleven common vegetables, including Amaranthus gangeticus, Ipomoea aquatica, and Ipomoea batatas were examined. The oxalic acid content was also determined.

(Chem. Abstr., (1948) 42, 2690i).

268. SATO, M., HIRANO, T. & MIZUNO, N.

"Nutrition-Chemical investigation on vegetables produced in Taiwan. I. Inorganic constituents of ashes and their basicity".

J. Soc. Trop. Agr., Taihoku Imp. Univ., (1942) 14, 212-220.

The ash from eleven common table vegetables, including Amaranthus gangeticus, Ipomoea aquatica, and Ipomoea batatas were analyzed for calcium, magnesium, potassium sodium, chloride, sulphate, copper, manganese, iron and silica.

(Chem. Abstr., (1948) 42, 2691a).

269. SCHAAFHAUSEN, R.

"Adlay or Job's tears - a cereal of potentially greater economic importance".

Econ. Botany, (1952) 6, 216-227.

A general article on Job's tears. The author considers that this cereal could become an important foodstuff.

270. SCHMIDT-HEBBEL, H., FERNANDEZ, B. & OYANEDEL, M.

"Comparative estimations on the nutritive value of potatoes, sweet potatoes and Jerusalem artichoke".

Pharm. Zentralhalle, (1940) 81, 289-291.

Analytical results are presented.

(Chem. Abstr., (1941) 35, 1137^2).

271. SEAGAR, E.A.

"Defective diet. Notes on the feeding of indigenous rats on tannia and other tubers, with special reference to the question of toxic effects".

Trop. Agriculture, (Trinidad)(1930) 7, 120-122.

Rats fed on Colocasia macrorrhiza tubers were found to survive longer than those fed on Irish potatoes. Cooking improved the survival time, but this may be due to disruption to cells and greater availability of the starch, rather than to any toxic principle. Injection of raw juice had no toxic effect.

272. SIDDAPPA, G.S.

"Studies on fruit and vegetable products. III. Ascorbic acid (vitamin C) content of some fruits, vegetables and their products"

272. (Cont'd)

Indian J. Agr. Sci., (1943) 13, 639-645.

Fresh tender Momordica Charantia (Karela) contained 188 mg./100 g. ascorbic acid and the juice 175 mg./100 ml. The dried vegetable contained 150 mg./100 g.

(Chem. Abstr., (1948) 42, 2690e)

273. SIDDAPPA, G.S. & BHATIA, B.S.

"The identification of sugars in fruits by paper chromatography".

Indian J. Hort., (1954) 11, 19-23.

The sugars present in some Indian fruit juices were identified by paper partition chromatography with butanol-acetic acid-water (40: 10: 50) as solvent and 0.5 g. benzidine dissolved in 10 ml. glacial acetic acid, 10 ml. of 10% trichlor-acetic acid and 80 ml. absolute alcohol as spray reagent. Sucrose, fructose and glucose were found in mangosteen fruit (Garcinia mangostana), ripe jackfruit (Artocarpus integrifolia), ripe Badami and Raspuri mango, Sathgudi orange (Citrus sinensis), Coorg orange (C. reticulata), litchi (Litchi chinensis), ripe and unripe sapota (Achras sapota), pineapple (Ananas sativus) (Kew variety), and ripe guava (Psidium guajava, Allahabad variety). Fructose and glucose and a trace of sucrose were found in apple (Kulu yellow), papaya (Carica papaya), and passion-fruit (Passiflora edulis). Only fructose and glucose were present in palm kernel (Borassus flabellifer), white (Kodaikanal) and purple (Bangalore) grape, yellow cashew apple (Anacardium occidentale), mangosteen shell extract, pomegranate (Punica granatum) jaman (Eugenia jambolana), Coorg honey, dried Arabian date, and acid-hydrolyzed mango-steen fruit. Jackfruit rind extract contained only fructose and arabinose was found only in mangosteen shell extract and apple juice. Mangosteen juice also contains a sugar, possibly maltose, with an R_f value slightly less than that for sucrose. The percentage reducing and total sugars present in a number of fruits is given.

(Chem. Abstr., (1954) 48, 10250-10251.

274. SIDDAPPA, G.S. & BHATIA, B.S.

"Tender green mangoes as a source of vitamin C".

Indian J. Hort., (1954) 11, 104-111.

274. (Cont'd)

The ascorbic acid content of fresh green mango pulp, peel and kernel was found to be 78.8, 54.6, and 5.34 mg./100 g. respectively.

(Chem. Abstr., (1955) 49, 7772h).

275. SMITH, R.C. & OTIS, L.

"The banana as a source of iron for hemoglobin formation".

J. Home Econ., (1936) 28, 395-398.

Feeding experiments with nutritionally anemic rats indicate that all the iron of bananas is available.

(Chem. Abstr., (1936) 30, 7638^{6}).

276. SMITH, R.

"The banana".

Agronomia (Cuba), (1941) 1, 126-128.

The chemical composition and food value of the banana are discussed.

(Chem. Abstr., (1942) 36, 1688^{8}).

277. SOLANO SALCEDO, C.A.

"Carica papaya L. Estudio del Fruto. (Carica papaya L. study of the fruit)".

Rev. farm. y quim. (Barranquilla, Colombia), (1946) 1, 139-145.

An analysis of papaya fruit showed 64-92% water, 0.9-1.1% cellulose, 4.3-7.4% reducing sugars, 0.25-0.4% other extract, 0.64-0.86% calcium, 0.087% magnesium, 0.0025% iron, 52-63γ% thiamine, 23-28γ% riboflavin, 0.15-0.76γ% nicotinic acid and 74-136 mg.% ascorbic acid.

278. SPENCER, J.L., MORRIS, M.P. & KENNARD, W.C.

"Vitamin C concentration in developing and mature fruits of mango (Mangifera indica)".

Plant Physiol., (1956) 31, 79-80.

The four varieties used showed a downward trend from 80-100 mg.% at five weeks after fruit set, to 10-30 mg.% at maturity. In the ripe fruit the highest concentration was in the peel and in the flesh adhering to the husk.

(Chem. Abstr., (1956) 50, 10873i).

279. SPOON, W. & van DUUREN, A.J.

"Banana flour from Surinam".

Ber. Afdeel. Handl museum Konink. Ver Kolenniaal Inst., (1942) No. 181.

(Chem. Zentr., (1943) 1, 1011).

279. (Cont'd)

Flour from tree ripened bananas contained 11.8% water, 3.0% ash, .4% crude fibre, and 45 γ/100 g. carotene.

(Chem. Abstr., (1944) 38, 3736[6]).

280. SPRUYT, J.P. & DONOTH, W.F.

"Carotene (provitamin A) content of some (East) Indian vegetable foodstuffs".

Geneeskund. Tijdschr. Nederland-Indië, (1938) 78, 31-38.

The carotene content of Gnetum gnemon is given as 3.7 mg.%.

(Chem. Abstr., (1938) 32, 8028[7]).

281. STAHL, A.L.

"Composition of miscellaneous tropical and sub-tropical Florida fruits".

Florida agric. Expt. Sta. Bull., (1955) No. 283, 20 pp.

Six samples from nineteen varieties of mango were examined, also one sample of Anona charimola, five samples of A. squamosa, five samples of A. muricata, five samples of papaya, 26 samples of Eugenia jambos 18 samples of E. jambolana, and 18 samples of E. uniflora. The mean results are tabulated below:

	water %	fat %	protein %	ash %	total sugars %
Mango	81.9	0.60	0.49	0.49	11.4
Anona charimola	71.1	0.72	0.94	1.10	9.64
A. squamosa	72.0	0.65	1.60	0.98	14.58
A. muricata	80.4	0.51	1.20	0.56	13.65
Carica papaya	91.0	0.45	0.25	0.35	5.65
Eugenia jambos	81.7	0.56	0.62	0.29	10.25
E. jambolana	83.2	0.26	0.47	0.15	11.45
E. uniflora	91.7	0.36	0.79	0.25	5.91

282. STEVENS, E.... & WHEELER, A.S.

"The chemical composition of Ipomoea pendurata".

J. Elisha Mitchell Sci. Soc., (1932) 47, 16.

The roots of Ipomoea pendurata contain 71.5% water, 0.36% invert sugar, 0.3% sucrose, 10.1% cellulose and 12.5% ash.

(Chem. Abstr., (1932) 26, 2488[4]).

283. SUBRAHMANYAN, V., SWAMINATHAN, M. & MURTHY, H.B.

"Nutritive value of some subsidiary foods".

J. Sci. Ind. Research (India), (1950) 9 B, 135-136.

The analyses and nutritive values are given for tapioca, sweet potato, peanut cake flours, rice and various combinations of these.

(Chem. Abstr., (1952) 46, 9222g).

284. SUBRAMANYAN, N., RAO, M.V.L. & SRINIVASAN, M.

"Nutritive value of seed proteins of Sesbania grandiflora"

Current Sci. (India), (1952) 21, 339-340.

The husked seeds of Sesbania grandiflora contain 7% protein of low biological value. The protein is deficient in lysine and sulphur containing amino-acids.

(Chem. Abstr., (1953) 47, 8862e).

285. SUBRAMANYAN, N. & SRINIVAVASAN, M.

"Investigations on some little known indigenous edible plant materials. II. Amaranthus paniculatus: the nutritive value of this seed as possible sources of food supplements".

Proc. 39th Indian Sci. Congr. Pt. 3 Abstracts, (1952) 273-274.

The seeds were found to be a rich source of calcium and protein. When fed at the 10% protein level, the nutritive value was comparable with casein.

286. SWAMY, B.G.L. & SREENIVASAYA, M.

"Vitamin requirements of the rice moth, Corcyra cephalonica, Staint (Lep.)".

Curr. Sci., (1940) 9, 493-494.

The growth responses of rice moth larvae on various diets including sago are given. An analysis of sago is given as: 0.13% protein, 0.10% fat, 78.16% nitrogen free extract and 0.16% ash.

287. TAKAHASHI, T.

"The proteins of the tuber of the yam (Dioscoria)".

Bull. Agr. Chem. Soc., (Japan), (1928) 4, 53-55.

The protein of yam is said to be rich in tryptophan and diamino acids.

(Chem. Abstr., (1930) 24, 35319).

288. TAKAHASHI, T.

"Hydrolytic products of the mucilage of yam".

J. Agr. Chem. Soc. Japan, (1938) 14, 650-658.

288. (Cont'd)

Yam mucilage was shown to contain 3.74% proline, 0.04% serine, 2.67% lucine, 1.40% isoleucine, 1.04% valine, 2.50% aspartic acid, 5.49% glutamic acid, 1.57% arginine, 2.65% histidine, 7.89% lysine 1.21% cystine and 2.26% tryptophan or an ash free dry weight basis.

(Chem. Abstr., (1938) 32, 9176^3).

289. TAKAHASHI, C.T. & TAKADA, A.

"Vitamins in the sweet potato. I. The value of steamed sweet potato as a source of vitamin C".

J. Japan Soc. Food Nutrition, (1949) 1, 162-163.

88.2% of the total ascorbic acid is retained after sweet potatoes have been steamed.

(Chem. Abstr., (1950) 44, 5033h).

290. TATSUO HIEDA

"Free and fixed vitamin B_1 contents of principal foodstuffs in the Nagoya district.

Nagoya J. Med. Sci., (1944) 59, 403-410.

Taro is stated to contain 90.8% total thiamine of which 11.36% was present as cocarboxylase.

(Chem. Abstr., (1948) 42, 690b).

291. TEDDER, J.L.O.

"Breadfruit drying in the Reef Islands".

Sth. Pac. Com. Quart. Bull., (1956) 6, No. 3, 21-22.

The method of drying breadfruit in the Reef Islands is described. An analysis of the dried breadfruit is given. (See reference No. 237).

292. THOMPSON, A.

"The composition of Hawaiian fruits and nuts".

Hawaii. Agric. Expt. Sta., Rept., (1915) 1914, 62-75.

An analysis of ripe papaya from six countries was made. These had the following range of values: 10.19-14.41% total solids, 0.48-0.90% ash, 0.43-0.90% N x 6.25, 0.00-1.26% sucrose, 7.5-10.3% reducing sugars, 0.05-0.25% fat, and 0.66-1.09% fibre.
Figures are also given for papaya at various stages of ripeness.

(Pope, W.T.: Hawaii Agric. Expt. Sta. Bull., (1930) 61. p. 35).

293. TOSHIO MUTO

"Micro components in living bodies by paper partition chromatography. II. Distribution of free amino-acids in root crops".

J. Agric. Chem. Soc. Japan, (1950) 24, 325-330.

Free amino-acids in 11 root crops were detected on paper by the improved method described above. Samples included: potato, sweet potato, taro, elephant foot, Chinese yam, Jerusalem artichoke (wild and cultivated strains), ginger, edible burdock, radish, common turnip and carrot. Many free amino-acids, the existence of which were not yet reported, were found in the alcoholic extracts of these roots. The kinds and quantities of free amino-acids were considerably different among species, but in one species no difference was found in their contents between surface and interior of the roots. Among many free amino-acids detected the following were most widely distributed: alanine, aspartic and glutamic acids, asparagine, glutamine glycine, lysine, serine and valine. The next group of amino-acids detected were: arginine, cystine, histidine, isoleucine, leucine, methionine, threonine and tryptophan. The characteristics in the free amino-acid contents of the roots crops were discussed.

(Chem. Abstr., (1953) 47, 1219b).

294. TRAUB, H.P., THOR, C.J.B. & ZELENY, L.

"Chemical composition of truck crops. I. New Zealand spinach, Tetragonia expansa".

Minn. Hort., (1929) 57, 172-173.

Tips of New Zealand spinach contain 89.9% water, 3.3% protein, and 2.1% ash.

(Chem. Abstr., (1930) 24, 30639).

295. TURBOTT, I.G.

"The value and importance of portulaca as a native food in the Phoenix Islands, Central Pacific".

Mankind, (1954) 4, 495-508.

One sample of fresh and one sample of dried Portulaca luten from Canton Island were analysed and found to contain: 86.5%, 16.1% water, 1.03, 5.2% N x 6.25, 1.9, 11.0% ash, 0.2, 1.0% ether extract, 1.2, 9.2% crude fibre and 10.0, 3.3 mg.% ascorbic acid respectively.
Methods of preparation and use of Portulaca are described.

296. TYUTA HATA "Formosa plant seed oils. XV. Pineapple, tomato, passiflora and sugar-apple seed oils".

J. Chem. Soc. Japan, (1938) 59, 1099-1103.

Passiflora edulis seeds contain 20% drying oil; 11.5% palmitic and stearic acids, and 88.5% linolic and oleic acids.

(Chem. Abstr., (1939) 33, 1977[6]).

297. URRUTIA, J.A. "Photocolorimetric determination of nicotinic acid in several national breadstuffs".

Actas y trabajas congr. peruano quim., 3e congr. (Lima, Peru), (1949) 2, 471-472.

Sweet potato is said to contain 0.1 mg.% nicotinic acid.

(Chem. Abstr., (1951) 45, 5835f).

298. VALENZUELA, A. & WESTER, P.J. "Composition of some Philippine fruits, vegetables and forage plants".

Philipp. J. Sci., (1930) 41, 85-100.

Composition figures are given for Artocarpus olerratissima Blanco seeds, Cyrtosperma merkusii (Hassk) Schott and Alocasia macrorrhiza (Linn) Schott tubers.

	Water %	N x 6.25 %	Ether extract %	Crude fibre %	Starch %	Ash %
Alocasia macrorrhiza (Linn) Schott - tubers	63.18	3.27	0.24	1.14	20.45	1.10
Artocarpus oderratissima Blanco seeds	64.55	1.29	13.29	-	-	1.64
Cyrtosperma merkusii (Hassk) Schott - tubers	62.61	0.81	0.09	1.57	22.92	1.05

299. VALLAYES, G. "Le Coix lacryma-jobi (Job's tears)".

Bull. Agr. Congo-Belge, (1948) 39, 247-304.

A complete survey of all aspects of Job's tears (Coix lacryma jobi) is presented.

300. van VEEN, A.G. "Cassava leaves as a valuable leafy vegetables".

Geneeskund. Tijdschr. Nederland-Indie, (1938) 78, 2548-2552.

300. (Cont'd)

Young cassava leaves contain 23-28% dry matter, 8% protein, 1.2% lipoids, 130-160 I.U./g provitamin A and 1.5-1.8 mg./g ascorbic acid.

(Chem. Abstr., (1939) 33, 7669).

301. VELAZQUEZ, G. & POSADAS, D.A.

"Calcium determination in some foodstuffs used by the people of Corrientes".

Re. Asoc. bioquim. argentina (1946) 13, 179-182.

The water, ash and calcium content of foodstuffs used in Corrientes was determined. Included in the results were:

	Water %	Ash %	Calcium %
Sweet potato	67.6	0.59	38.9
Manioc	68.5	0.41	33.6
Banana	80.2	0.73	7.0

(Chem. Abstr., (1947) 41, 537e).

302. VINCENTE, H. de G.

"A banana, fruto de todo o ano alimento-medicamento. (The banana, food and medicine for all)".

Published privately at Funchal, Madeiro, 187 pp.

(Chem. Abstr., (1940) 34, 5195).

303. VINICK, L.

"The composition of some tropical and sub-tropical fruits in Palestine".

Yedeoth, (1938) 4, 65.

The composition of various fruits is given, including:

	Water %	Ash %	Fat %	Protein %	Sugars %
Mangifera indica	79.2	0.5	0.4	0.5	16.9
Psidium guava	85.0	0.8	0.3	0.5	4.8
Anona squamosa	74.6	0.9	0.3	1.2	16.6
A. cherimola	79.7	1.1	0.9	1.5	9.7

(Chem. Abstr., (1946) 40, 7438[1]).

304. WARDLAW, C.W.

"Tropical fruits and vegetables. An account of their storage and transport".

Trop. Agr. (Trinidad), (1937) 14, 320-326, 342-350.

The storage, transport and other factors affecting sapodilla (Achras sapola) are discussed with six

304. (Cont'd.)

references. soursop (Anona muricata), sweetsop (Anona squamosa and custard apple (Anona reticulata) with two references, spinach (Spinacia oleracea) with five references, sugar cane (Saccharum officinarum) with one reference, sweet potato (Ipomoea batatas) with twenty-three references, and tomatoes (Lycopersicum esculentum) with sixty-four references. Topepo (tomato pepper cross), tree tomato (Cyphomandra betacea), water cress (Nasturtium officinale), yams (Dioscorea alata and D. sp.), cassava (Manihot utilissima) and langsat (Lansium domesticum) are discussed with about two references each.

(Chem. Abstr., (1938) 32, 13479).

305 WHEELER, K., TRESSLER, D.K. & KING, C.G.

"Vitamin C content of vegetables. XII. Broccoli, cauliflower, endive, cantaloup, parsnips, New Zealand spinach, kohlrabi, lettuce and kale".

Food Research, (1939) 4, 593-604.

The ascorbic acid content of New Zealand spinach is given as 45 mg%.

306 WILLCOX, E.G.

"A study of colocasia (Colocassium antiquorum Schott).

Cyprus Agr. J (1936) 31, 94-108.

This is a study of the history, distribution, production economics and nutritive value of taro. Values are given for two varieties of taro, Morphon and Karpas grown in Cyprus are: water 75.7, 78.6; ash 1.5, 1.4; fibre 0.8, 0.7; N x 5.68, 1.9, 1.8; starch (difference) 16.1, 13.7; sugar 3.8, 3.6 and fat, 0.2, 0.2% respectively.

307 WITTWER, S.H.

"Vegetable crops in relation to soil fertility. IV. Nutritional value of New Zealand spinach".

J. Nutrition, (1946) 31, 59-65.

New Zealand spinach was shown to contain 27 mg.% ascorbic acid (fresh weight), 7.1% oxalate, 4.9% nitrogen, 2.7% phosphate, 0.54% calcium and 0.4% magnesium (dry weight).

308 WITTWER, S.H., ALBRICHT, W.A. & SCHROEDER, R.A.

"Vegetable crops in relation to soil fertility. V. Calcium contents of green leafy vegetables".

Food Research, (1947) 12, 405-413.

The average calcium content of New Zealand spinach is given as 0.55% on a dry weight basis.

309. WOODMAN, H.E., MENZIES, A.W., KITCHIN, A.W.M. & EVANS, R.E.

"The value of tapioca flour and sago pith meal in the nutrition of swine".

J. Agric. Sci., (1931) 21, 526-546.

Sago pith contained (on a dry weight basis) 1.94% protein, 0.44% ether extract, 88.71% nitrogen free extract 4.97% crude fibre, 3.94% ash, 2.09% silica, 1.85% silica free ash, 0.38% calcium oxide, 0.13% phosphorus pentoxide, 0.62% potassium oxide, 0.28% sodium oxide 0.15% magnesium oxide, 0.65% chloride. After feeding trials on two pigs, it is claimed that tapioca flour is more digestible. Sago meal was not good for young pigs.

310. YAMAMOTO, R., SUMI, M. & AKO, T.

"Vitamin B_1, and riboflavin in the growing point of sugar".

Bull. Inst. Phys. Chem. Research (Tokyo), (1940) 19, 1318-1320.

The amounts of thiamine and riboflavin in dried cane tops (9.8% water) ranged from 236-563 and 110-330 γ/100 g. respectively.

(Chem. Abstr., (1941) 35, 1833^4).

311. YAMAMOTO, Y. & TOMITA, Y.

"A fluorometric method for determining the riboflavin content of sweet potatoes".

Bull. Fac. Agr., Kagoshima Univ., (1954) 3, 114-121.

The riboflavin content of sixteen species of sweet potatoes varied from 0.010 to 0.060 mg.%.

(Chem. Abstr., (1956) 50, 6566d).

312. YOSHIJIRO KIHARU & ZENICHI KAWASE

"Digestibility of starch and starchy foods".

Rept. Food Res. Inst., (Japan). (1949) 2, 25-35.

The digestibility of sago starch was determined by suspending a sample of 1% takadiastase at 37% for two weeks. It was found that 22.36% was converted to reducing sugars.

(Chem. Abstr., (1953) 47, 7126i).

313. YOUNG, R.A.

"The dasheen".

U.S. Dept. Agric. Farmers' Bull., No. 1396, Washington, (1924).

513. (Cont'd)

An analysis of dasheen is given as 62.77% water, 3.03% protein, 26.09% starch, 1.75% soluble sugars, 1.24% pentosans, 0.16% ether extract, 1.3% ash and 0.71% crude fibre.

(Miller, C.D.: Bernice P. Bishop Mus. Bull., (1927) 37).

FOOD COMPOSITION TABLES

The following food composition tables which have been derived mainly from the literature, contains composition figures for some of the foods found in the South Pacific.

514. ALEJO, L.G., CODUCO, P.T. & CORTEZ, R.

"Tentative table on composition of Philippine foods".

Institute of Nutrition, Department of Health, Republic of the Philippines, August 1953 (duplicated).

515. ALL INDIA VILLAGE INDUSTRIES ASSOCIATION

"Table of Indian food values and vitamins".

Published by J.C. Kumarappa, The All Indian Village Industries Association, Maganvadi, Wardha, M.P. India (1951).

516. AUTRET, M. & NGUYEN-VAN-MAU

"Tables alimentaires indochinoises. (Indochinese food tables)".

Rev. med. Française d'Extrême-Orient, (1944) 1, 73-77.

517. AYKROYD, W.R., PATWARDHAN, V.N. & RANGANATHAN, S.

"The nutritive value of Indian foods and the planning of satisfactory diets".

Health Bulletin No. 23, 1951. Government of India Press.

518. BUCHANAN, J.C.R.

"A guide to Pacific Island dietaries".

South Pacific Health Service, Suva, Fiji, 1947.

519. CHATFIELD C.

"Food composition tables for international use".

Food and Agriculture Organization, Nutritional Studies No. 3., (1953), Rome.

520. CHATFIELD, C.

"Food composition tables, minerals and vitamins for international use".

Food and Agriculture Organization, Nutritional Studies No. 11, (1954), Rome.

321. LEUNG, W-T.W., PECOT, R.K. & WATT, B.K. "Composition of foods used in Far Eastern countries". U.S. Dept. Agr., Agriculture Handbook No. 34, (1952).

322. PANNEKOEK-WESTENBURG, S.J.E. NIJHOPF, J.A. & van VEEN, H.G. "Voedungstabellen. Nieuwe volledig herziene uitgave van het Instituut voor Volksvoeding. (Food tables. A new revised edition prepared by the Institute for human nutrition)". (Geneesk. Tijds. Nederland-Indie, (1940) 80, 1927-1966.

323. PLATT, B.S. "Tables of representative values of foods commonly used in tropical countries". Med. Res. Council., Spec. Rept., No. 255, (1945).

324. RANDOIN, L., le GALLIC, P. & CAUDERET, J "Tables de composition des aliments. (Food composition tables)". Institut Scientifique d'Hygiène alimentaire, Paris, 2nd Edition (no date).

325. WATT, B.K. & MERRILL, A.L. "Composition of foods - raw, processed, prepared". U.S. Dept. Agr. Agriculture Handbook No. 8, (1950).

326. WILLIMOTT, S.G. "Malayan food composition table". Dept. Agr., Federation Malaya, Sci. Ser. No. 23, (1949).

AUTHOR INDEX

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Ipomoea batatas (leaves)	5, 40, 56, 75, 127, 187, 211, 215, 229,
Ipomoea other spp.	115, 282
Mangifera indica	21, 24, 40, 68, 73, 88, 89, 101, 105, 125, 126, 127, 134, 136, 187, 208, 212, 214, 215, 217, 218, 247, 248, 259, 265, 266, 274, 278, 281, 303
Metroxylon spp.	145, 147a, 150, 253, 286, 309, 312
Momordica charantia	5, 7, 8, 60, 125, 127, 272.

Name	Reference Nos.
Moringa oleifera	5, 38, 75, 230
Musa paradisiaca (plantain)	28, 29, 30, 68, 98, 113, 136, 141, 154, 175, 187, 211, 213, 214, 215, 217, 218, 266
Musa var. sapientum (banana)	2, 20, 21, 32, 36, 40, 47, 49, 50, 54, 55, 68, 73, 74, 76, 80, 85, 86, 88, 89, 91, 101, 104, 107, 108, 125, 140, 143, 151, 155, 159, 161, 164, 166, 176, 187, 204, 210, 211, 212, 213, 214, 215, 217, 218, 232, 251, 257, 275, 276, 279, 301, 302
Nipa spp.	15, 71
Pandanus spp.	189
Passiflora edulis	61, 132, 133, 148, 187, 240, 273, 296
Passiflora ligularis	68, 210, 214, 217, 218
Passiflora other spp.	18, 82, 89, 101, 105, 127, 137, 218, 238
Piper betel	33, 37
Portulaca oleracea	127, 187, 207, 212, 215, 216
Portulaca other spp.	5, 20, 68, 112, 295
Psophocarpus tetragonolobus	230
Pueraria sp.	60, 147a, 179
Saccharum officinarum	26, 94, 119, 130, 182, 221, 260, 304, 310
Sesbania grandiflora (leaves)	34, 70, 120, 141, 230, 284
Sesbania grandiflora (flowers)	127, 141, 187
Spondius spp.	126, 187
Syzygium spp.	126, 127, 214
Terminalia catappa	6, 208
Tetragonia expansa	56, 88, 89, 127, 170, 171, 210, 214, 215, 216, 218, 263, 294, 305, 307, 308
Xanthosoma spp.	5, 21, 25, 28, 62, 65, 66, 157, 187, 190, 208, 213, 214, 215, 229

GLOSSARY OF SCIENTIFIC NAMES

Scientific name	English or common name
Alcurites moluccana	Candle nut
Alocasia spp.	Taro
Amaranthus gangeticus	Amaranth
Amaranthus hybridus	Amaranth
Amorphophallus spp.	-
Ananas comosus	Pineapple
Anona muricata	Soursop
Anona reticulata	Custard apple
Anona squamosa	Sweetsop
Arachis hypogaea	Peanut
Artocarpus altilis (communis)	Breadfruit
Artocarpus integrifolia	Jackfruit
Bambusa spp.	Bamboo
Bruguiera	Mangrove Aibon
Cajanus cajan	Pigeon pea
Canarium spp	Pili nuts
Carica papaya	Papaya, pawpaw
Citrullus vulgaris	Watermelon
Cocos nucifera	Coconut
Coix lacryma-jobi	Job's tears, adlai
Colocasia spp.	Taro
Cucurbita maxima	Pumpkin
Cycas spp.	Japanese sago fern
Cyrtosperma spp.	Taro
Dioscorea alata	Yam
Dolichos lablab	Hyacinth bean
Eugenia jambos	Rose apple
Eugenia malaccensis	Malay apple

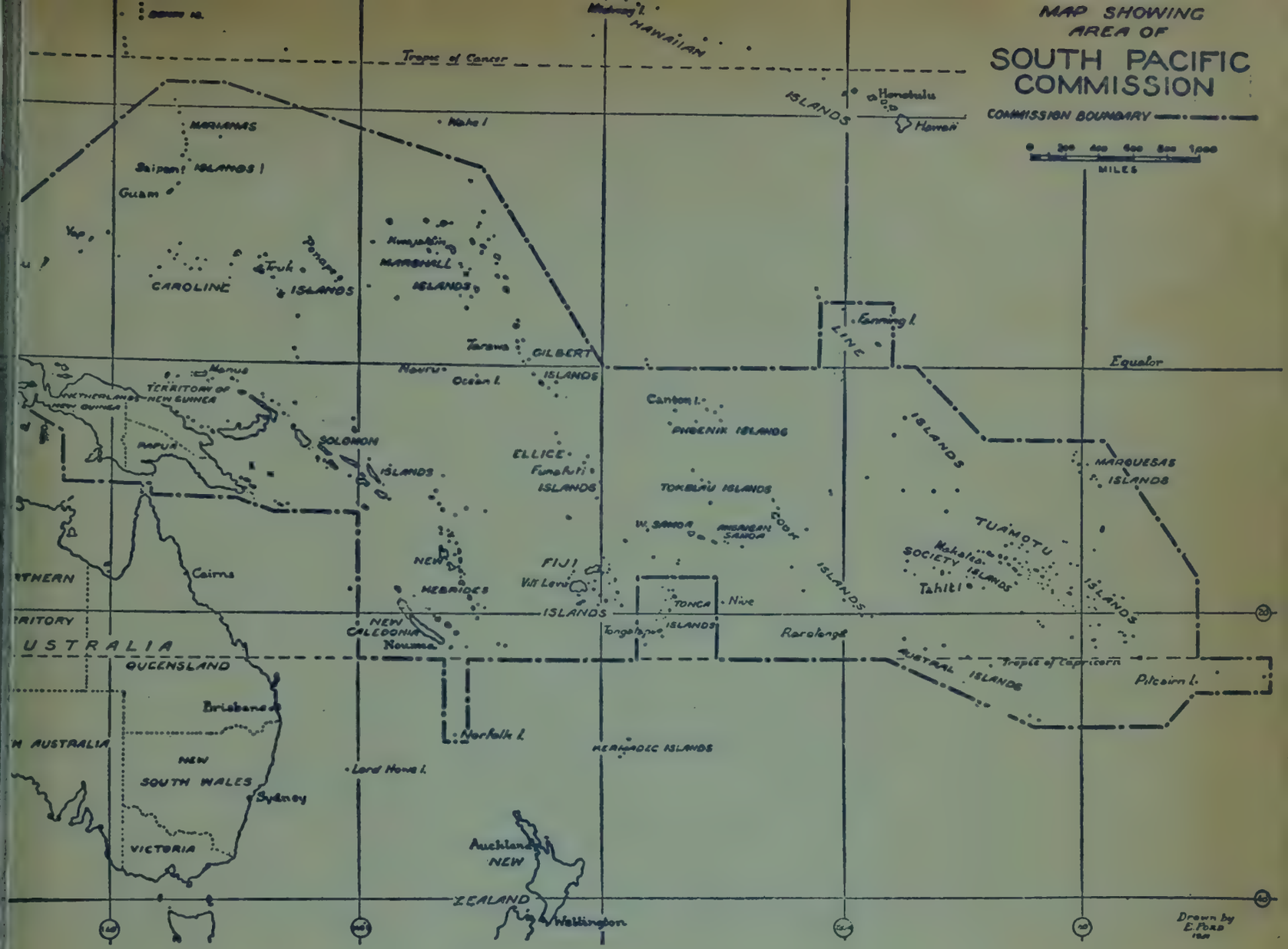
Scientific name	English or common name
Garcinia morella	-
Gnetum gnemon	-
Inocarpus fagifer	Polynesian chestnut
Ipomoea aquatica	Swamp cabbage, Kang Kung
Ipomoea batatas	Sweet potato
Mangifera indica	Mango
Manihot dulcis	Sweet cassava, tapioca, manioc
Metroxylon spp.	Sago
Momordica charantia	Bitter melon, Balsam pear
Moringa oleifera	Horse radish tree
Musa paradisiaca	Plantain
Musa paradisiaca var. sapientum	Banana
Nasturtium officinale	Watercress
Nipa spp.	Nipa palm
Pandanus spp.	Pandanus
Passiflora edulis	Passionfruit
Passiflora ligularis	Grandilla
Phaseolus vulgaris	Beans
Piper betel	Betel nut
Portulaca oleracea	Parslane, portulaca, pig weed
Psidium guajava	Guava
Psophocarpus tetragonolobus	Goa bean, winged bean
Pteris moluccana	Fern root
Pueraria spp.	-
Rubus spp.	Raspberry
Saccharum officinarum	Sugar cane
Sesbania grandiflora	-
Solanum melongera	Egg plant
Spondius spp.	Hog plum

Scientific name	English or common name
Syzygium spp.	
Terminalia catappa	Indian almond
Tetragonia expansa	New Zealand spinach
Xanthosoma spp.	Taro

Name	Cal-ories	Water g	Protein g	Fat g
1. Seeds, (pulses, nu				
Arachis hypogaea				
Artocarpus integrifoli				
Cajanus cajan				
Cocos nucifera mature				
" green,				
" green,				
" water,				
Coix lacryma-jobi				
Dolichos lablab				
Inocarpus fagifer				
Phaseolus vulgaris, dr				
" " gr				
Zea mais, dry				
" green				
2. Starchy foods				
Artocarpus altilis				
Bruguiera sp.				
Colocasia sp.				
Cyrtosperma sp.				
Dioscorea alata				
Ipomoea batatas, white				
" yello				
Manihot dulcis				
Metroxylon sago				
Musa paradisiaca var.				
Xanthosoma sp.				
3. Leafy vegetables				
Amaranthus sp.	45	86	3.0	0.5
Brassica sp.	35	88	1.9	0.1
Carica papaya leaves	90	75	3.0	2.0
Colocasia sp. leaves	50	86	2.5	2.0
Gnetum gnemon leaves	90	66	5.9	2.2
Ipomoea aquatica	30	90	4.0	0.5
Ipomoea batatas shoots	40	85	3.5	0.5
Manihot dulcis leaves	75	79	6.2	1.0
Nasturtium officinale	15	95	2.4	0.2
Tetragonia expansa	15	94	4.1	0.4
4. Fresh fruits				
Ananas comosus	60	85	0.5	0.2
Anona muricata	70	81	0.9	0.2
Anona reticulata	110	70	2.1	0.1
Anona squamosa	105	72	1.5	0.2
Carica papaya green	25	91	0.5	0.1
" ripe	40	88	0.5	0.1
Citrullus vulgaris	20	94	0.5	0.1
Eugenia jambos	50	85	5.5	0.2
Eugenia malaccensis	25	91	0.6	0.1
Mangifera indica	70	81	1.5	0.2
Passiflora edulis	70	71	1.5	2.0
Psidium guajava	65	76	1.5	1.0
Rubus sp.	55	83	1.0	0.2
Solanum melangera	25	92	1.3	0.3

106. (Cont'd)

Carbo-hydrate	Fibre	Calcium	Phosphorus	Iron	Carotene	Thiamine	Riboflavin	Niacin	Ascorbic acid
g	%	mg	mg	mg	mg	mg	mg	mg	mg
7	1.5	300	70	30.0	5.850	0.01	0.25	1.3	70
7	1.0	30	20	0.2	0.050	0.06	0.07	0.3	50
15	2.0	350	65	0.8	10.950	0.16	0.90	2.1	200
5	1.5	400	65	-	7.500	0.20	0.50	3.0	10
12	12.0	330	70	2.7	10.275	0.10	0.33	1.5	200
3	1.0	50	60	4.5	2.465	0.12	0.27	1.6	60
8	1.5	70	60	8.0	3.600	0.10	0.20	0.9	25
10	2.5	175	80	2.0	0.090	0.12	0.30	1.7	300
1	0.5	80	40	3.4	0.700	0.08	0.10	0.9	35
0.5	0.7	220	50	2.7	7.600	0.04	0.18	1.10	30
14	0.4	18	10	0.1	0.016	0.08	0.03	0.2	20
16	0.9	20	25	0.3	trace	0.09	0.06	0.7	20
26	0.9	20	25	0.5	0.018	0.10	0.12	0.8	50
24	1.5	20	30	0.6	0.007	0.10	0.12	1.0	40
6	0.5	40	25	0.3	0.045	0.03	0.03	0.2	30
9	0.5	20	15	0.4	0.290	0.03	0 03	0 4	70
5	0.1	4	5	0.4	0.030	0.02	0.02	0.2	7
6	2.0	45	10	0.5	0.120	0.02	0.03	0.5	15
5	0.7	6	15	0.4	0.006	0.03	0.03	0.3	15
16	0.5	10	15	0.4	1.375	0.05	0.05	0.5	75
15	10.0	9	70	-	-	nil	0.12	1.9	25
12	8.0	30	40	1.4	0.050	0.07	0.05	1.6	120
12	3.0	25	25	1.5	0.010	0.03	0.03	0.9	15
4	1.0	10	20	0.6	0.010	0.09	0.05	0.6	4



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